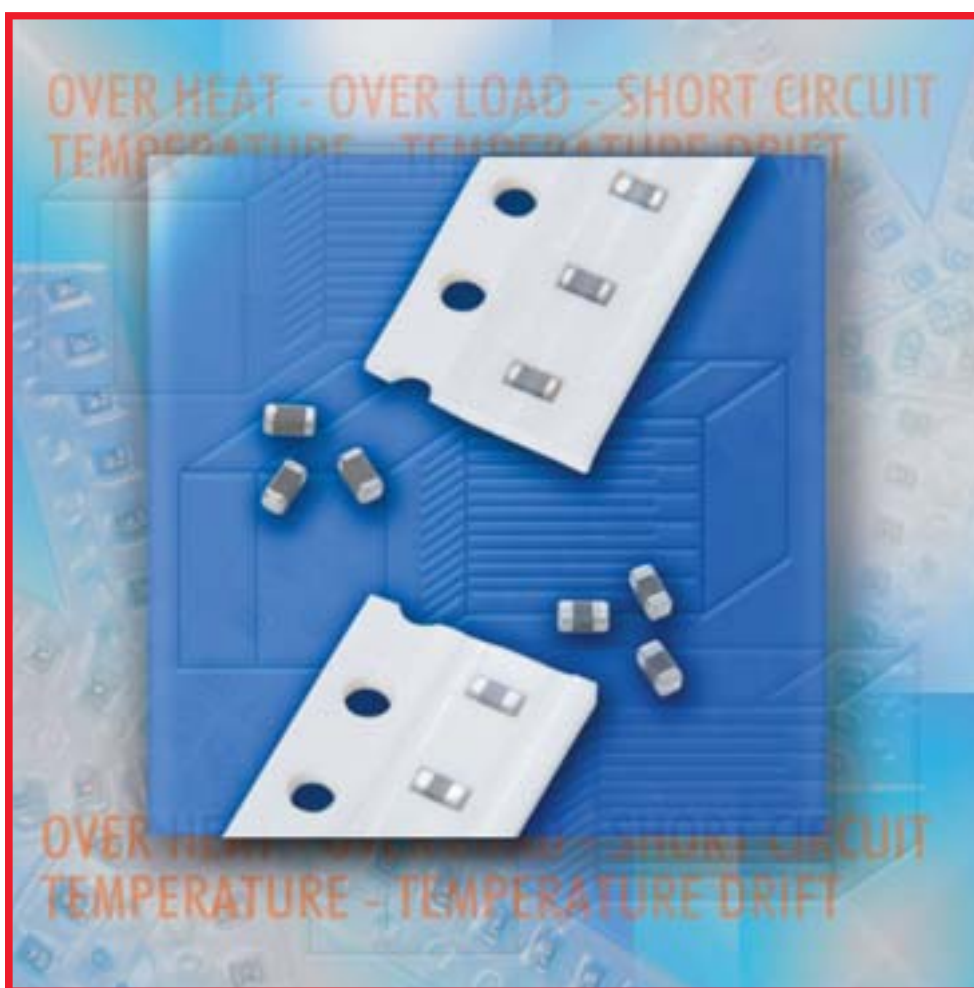
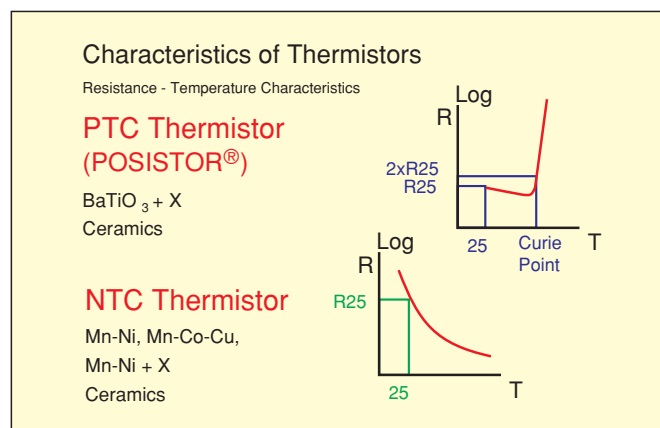
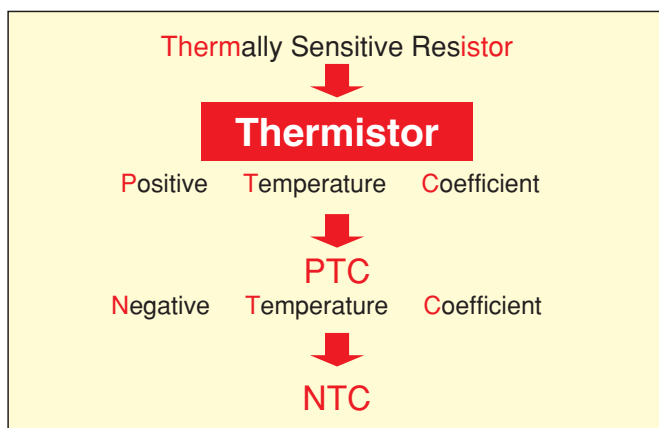


## PTC - NTC for Surface Mounting Application

**muRata**  
*Innovator in Electronics*



## What is a Thermistor?

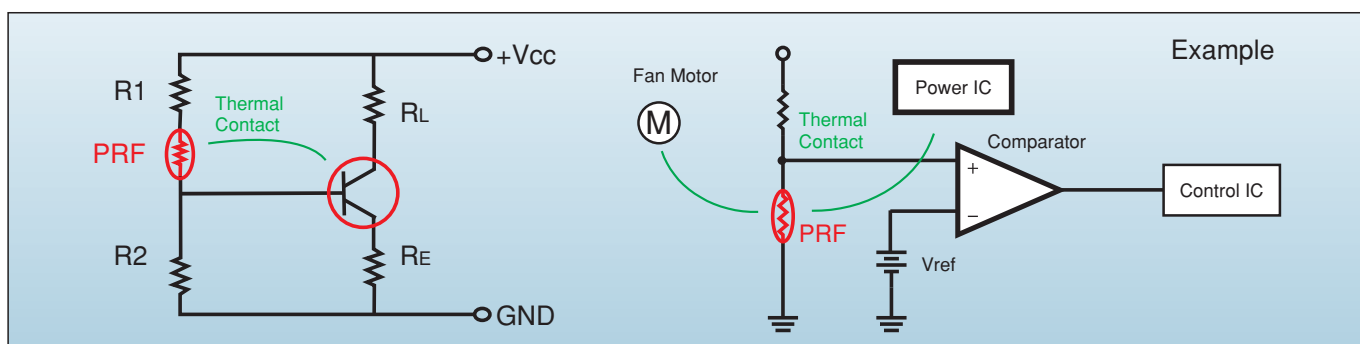


## PRF15/18 Series Chip POSISTOR® for Overheat Sensing

PRF15/18 PTC Chip Thermistors detect overheating of Hybrid ICs, Power Transistors, Power Diodes and Power ICs etc.

1. 0402 and 0603 light weight
2. High gain simplifies circuit design

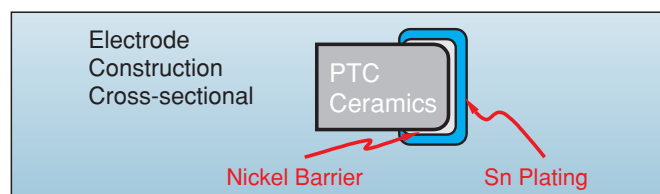
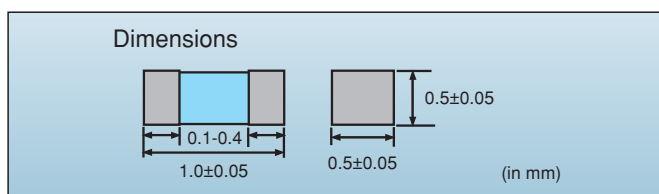
3. Free of contact noise and problems
4. Pb free plated terminations
5. Sturdy construction resists mechanical vibration and shock.
6. PRF18xxx5RB series is available for Reflow/Flow soldering.



## PRF15 Series Characteristics



| Part Number     | Sensing Temperature (at 100k ohm) (°C) | Sensing Temperature (at 10k ohm) (°C) | Max. Voltage (V) | Resistance (at 25°C) (ohm) | Operating Temp. (°C) |
|-----------------|----------------------------------------|---------------------------------------|------------------|----------------------------|----------------------|
| PRF15BA102RB6RC | 140 ±3°C                               | 125 ±5°C                              | 32               | 1k ±50%                    | -20 to 150           |
| PRF15BB102RB6RC | 130 ±3°C                               | 115 ±5°C                              | 32               | 1k ±50%                    | -20 to 140           |
| PRF15BC102RB6RC | 120 ±3°C                               | 105 ±5°C                              | 32               | 1k ±50%                    | -20 to 130           |
| PRF15BD102RB6RC | 110 ±3°C                               | 95 ±5°C                               | 32               | 1k ±50%                    | -20 to 120           |
| PRF15BE102RB6RC | 100 ±3°C                               | 85 ±5°C                               | 32               | 1k ±50%                    | -20 to 110           |
| PRF15BF102RB6RC | 90 ±3°C                                | 75 ±5°C                               | 32               | 1k ±50%                    | -20 to 100           |
| PRF15BG102RB6RC | 80 ±3°C                                | 65 ±5°C                               | 32               | 1k ±50%                    | -20 to 90            |



## PRF18 Series Characteristics

| Part Number     | Sensing Temperature<br>(at 4.7k ohm)<br>(°C) | Sensing Temperature<br>(at 47k ohm)<br>(°C) | Maximum<br>Voltage<br>(V) | Resistance<br>(at 25°C)<br>(ohm) | Operating<br>Temperature Range<br>(°C) |
|-----------------|----------------------------------------------|---------------------------------------------|---------------------------|----------------------------------|----------------------------------------|
| PRF18BG471QB5RB | 65 ±5°C                                      | 80 ±7°C                                     | 32                        | 470 ±50%                         | -20 to 90                              |
| PRF18BF471QB5RB | 75 ±5°C                                      | 90 ±7°C                                     | 32                        | 470 ±50%                         | -20 to 100                             |
| PRF18BE471QB5RB | 85 ±5°C                                      | 100 ±7°C                                    | 32                        | 470 ±50%                         | -20 to 110                             |
| PRF18BD471QB5RB | 95 ±5°C                                      | 110 ±7°C                                    | 32                        | 470 ±50%                         | -20 to 120                             |
| PRF18BC471QB5RB | 105 ±5°C                                     | 120 ±7°C                                    | 32                        | 470 ±50%                         | -20 to 130                             |
| PRF18BB471QB5RB | 115 ±5°C                                     | 130 ±7°C                                    | 32                        | 470 ±50%                         | -20 to 140                             |
| PRF18BA471QB5RB | 125 ±5°C                                     | 140 ±7°C                                    | 32                        | 470 ±50%                         | -20 to 150                             |
| PRF18AR471QB5RB | 135 ±5°C                                     | 150 ±7°C                                    | 32                        | 470 ±50%                         | -20 to 160                             |
| PRF18AS471QB5RB | 145 ±5°C                                     | -                                           | 32                        | 470 ±50%                         | -20 to 160                             |

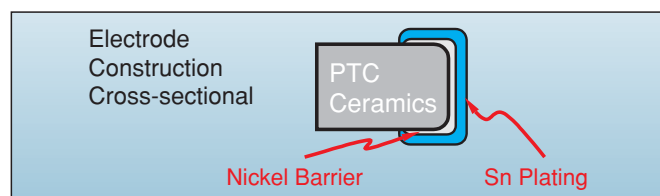
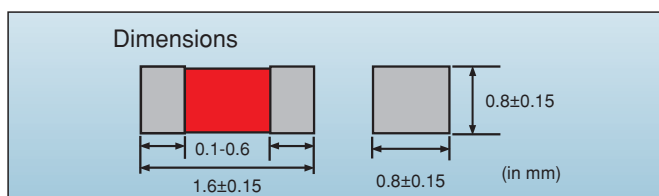
### Chip Tight Tolerance Type

| Part Number     | Sensing Temperature<br>(at 4.7k ohm)<br>(°C) | Maximum<br>Voltage<br>(V) | Resistance<br>(at 25°C)<br>(ohm) | Operating<br>Temperature Range<br>(°C) |
|-----------------|----------------------------------------------|---------------------------|----------------------------------|----------------------------------------|
| PRF18BG471RB5RB | 65 ±3°C                                      | 32                        | 470 ±50%                         | -20 to 80                              |
| PRF18BF471RB5RB | 75 ±3°C                                      | 32                        | 470 ±50%                         | -20 to 90                              |
| PRF18BE471RB5RB | 85 ±3°C                                      | 32                        | 470 ±50%                         | -20 to 100                             |
| PRF18BD471RB5RB | 95 ±3°C                                      | 32                        | 470 ±50%                         | -20 to 110                             |
| PRF18BC471RB5RB | 105 ±3°C                                     | 32                        | 470 ±50%                         | -20 to 120                             |
| PRF18BB471RB5RB | 115 ±3°C                                     | 32                        | 470 ±50%                         | -20 to 130                             |

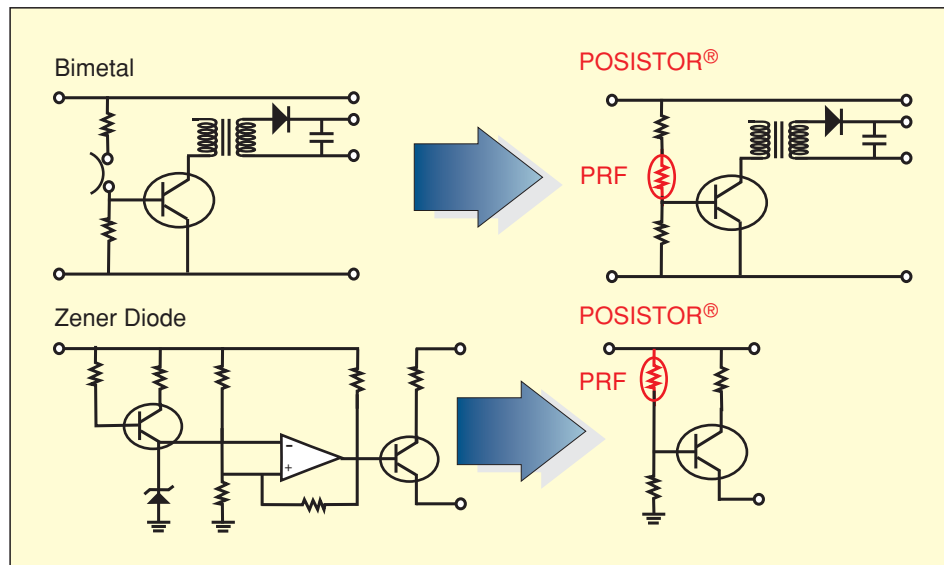
This product is applied to flow/reflow soldering. This product is recognized by UL.

| Part Number     | Sensing Temperature<br>(at 4.7k ohm)<br>(°C) | Maximum<br>Voltage<br>(V) | Resistance<br>(at +25°C)<br>(ohm) | Operating<br>Temperature Range<br>(°C) |
|-----------------|----------------------------------------------|---------------------------|-----------------------------------|----------------------------------------|
| PRF18BA103QB1RB | 130 ±5°C                                     | 32                        | 10k ±50%                          | -20 to 140                             |

Low Current Consumption!



## Circuit Examples



The POSISTOR® has the following advantages over Bimetal devices.

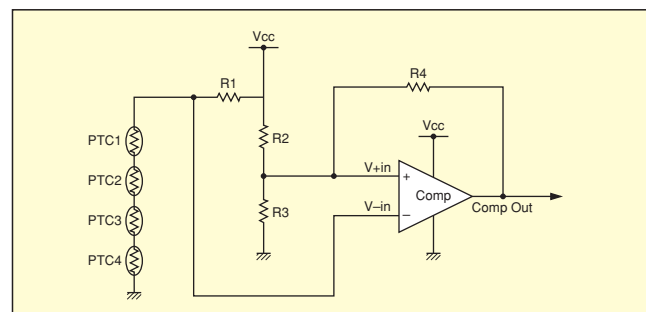
1. Noise free
2. No contact problems
3. Low price

The POSISTOR® has the following additional advantages over Zener Diodes.

1. Reduced numbers of parts used in circuits
2. Reduced process costs of mounting parts on PCBs
3. Reduces occupied space, helping high density PCB mounting

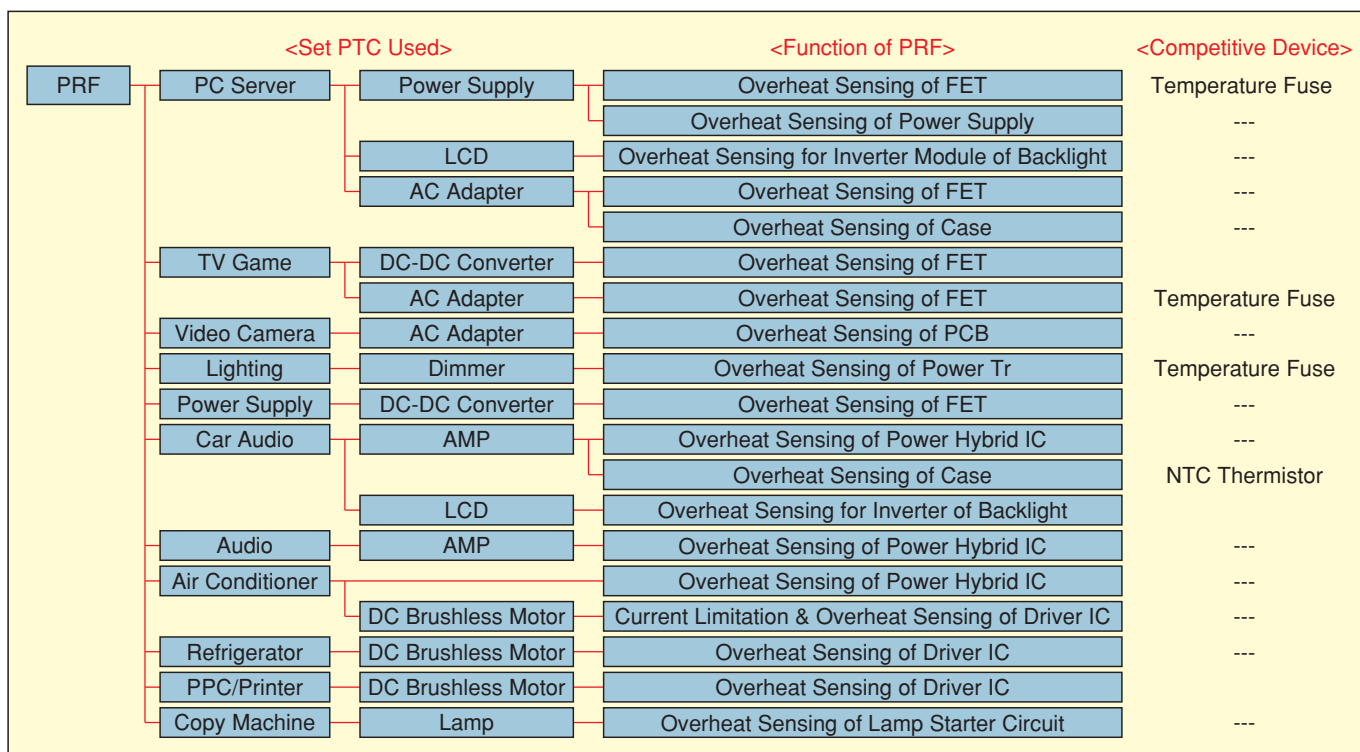
|               | Zener Diode                |           | POSISTOR®               |          |
|---------------|----------------------------|-----------|-------------------------|----------|
| Mounting Area | 10x10 = 100mm <sup>2</sup> |           | 6x6 = 36mm <sup>2</sup> |          |
| Parts         | Parts                      | UPS       | Parts                   | UPS      |
|               | Diode                      | 1         | POSISTOR®               | 1        |
|               | Transistor                 | 2         | Transistor              | 1        |
|               | Resistor                   | 7         | Resistor                | 2        |
|               | Op. Amp.                   | 1         | Op. Amp.                | 0        |
|               | <b>Total</b>               | <b>11</b> | <b>Total</b>            | <b>4</b> |

More than two pieces of POSISTOR® can cover multi hot spots working with a comparator. Fig. shows basic circuit idea to connect multiple POSISTOR® in series. When One POSISTOR® detects overheat at least, a comparator can work by the sharp temperature-resistance characteristic. It easily allows changing a number of POSISTOR® or sensing temperature in the same basic circuit design.



Connection of multiple POSISTOR®

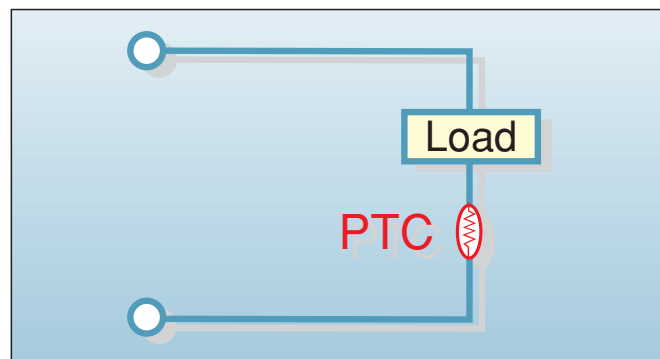
## Markets & Applications of Overheat Sensing



## PRG18/21 Series Chip POSISTOR® for Overcurrent Protection

Chip Thermistors prevent failure of apparatus due to excess current.

1. 0603 and 0805 light weight
2. High gain simplifies circuit design
3. Free of contact noise and problems
4. Pb free plated terminations
5. Sturdy construction resists mechanical vibration and shock.



## PRG Series Characteristics

Chip Type 0603 Size

| Part Number     | Max. Voltage (V) | Hold Current (at +60°C) (mA) | Hold Current (at +25°C) (mA) | Trip Current (at +25°C) (mA) | Trip Current (at -10°C) (mA) | Max. Current (mA) | Resistance (at +25°C) (ohm) |
|-----------------|------------------|------------------------------|------------------------------|------------------------------|------------------------------|-------------------|-----------------------------|
| PRG18BB471MB1RB | 24               | 7                            | 10                           | 21                           | 25                           | 60                | 470 ±20%                    |
| PRG18BB221MB1RB | 24               | 10                           | 14                           | 29                           | 35                           | 130               | 220 ±20%                    |
| PRG18BB101MB1RB | 24               | 15                           | 21                           | 45                           | 55                           | 300               | 100 ±20%                    |
| PRG18BB470MB1RB | 24               | 20                           | 29                           | 61                           | 75                           | 630               | 47 ±20%                     |
| PRG18BB330MB1RB | 24               | 25                           | 36                           | 71                           | 85                           | 900               | 33 ±20%                     |
| PRG18BC6R8MM1RB | 20               | 80                           | 120                          | 260                          | 320                          | 3500              | 6.8 ±20%                    |
| PRG18BC4R7MM1RB | 20               | 100                          | 155                          | 330                          | 400                          | 5000              | 4.7 ±20%                    |
| PRG18BC3R3MM1RB | 12               | 120                          | 180                          | 400                          | 480                          | 4500              | 3.3 ±20%                    |
| PRG18BC2R2MM1RB | 9                | 150                          | 220                          | 500                          | 600                          | 5000              | 2.2 ±20%                    |
| PRG18BC1R0MM1RB | 6                | 220                          | 330                          | 740                          | 850                          | 7500              | 1.0 ±20%                    |

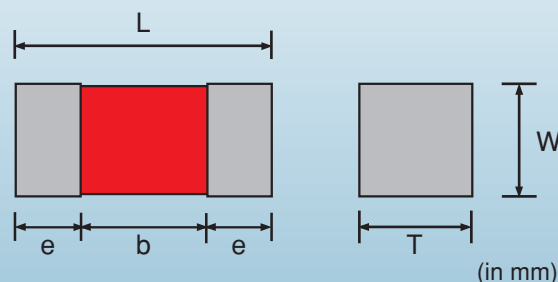
## Chip Type 0805 Size

| Part Number     | Max. Voltage (V) | Hold Current (at +60°C) (mA) | Hold Current (at +25°C) (mA) | Trip Current (at +25°C) (mA) | Trip Current (at -10°C) (mA) | Max. Current (mA) | Resistance (at +25°C) (ohm) |
|-----------------|------------------|------------------------------|------------------------------|------------------------------|------------------------------|-------------------|-----------------------------|
| PRG21BB220MB1RK | 20               | 30                           | 44                           | 91                           | 110                          | 1100              | 22 ±20%                     |
| PRG21BB150MB1RK | 20               | 40                           | 59                           | 116                          | 140                          | 1600              | 15 ±20%                     |
| PRG21BC6R8MM1RA | 20               | 80                           | 120                          | 260                          | 320                          | 3500              | 6.8 ±20%                    |
| PRG21BC4R7MM1RA | 20               | 100                          | 155                          | 330                          | 400                          | 5000              | 4.7 ±20%                    |
| PRG21BC3R3MM1RA | 16               | 120                          | 180                          | 400                          | 480                          | 6000              | 3.3 ±20%                    |
| PRG21BC2R2MM1RA | 12               | 150                          | 220                          | 500                          | 600                          | 6500              | 2.2 ±20%                    |
| PRG21BC1R0MM1RA | 9                | 220                          | 330                          | 740                          | 850                          | 10000             | 1.0 ±20%                    |
| PRG21BC0R6MM1RA | 6                | 285                          | 420                          | 920                          | 1100                         | 10000             | 0.6 ±20%                    |
| PRG21BC0R2MM1RA | 6                | 500                          | 750                          | 1620                         | 2000                         | 10000             | 0.2 ±20%                    |

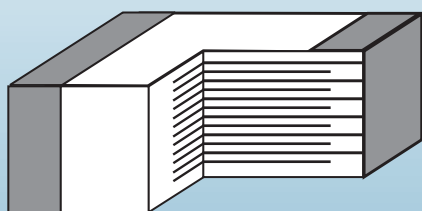
Maximum Current shows typical capacities of the transformer which can be used. Please contact us for UL recognized products.

### Dimensions

|   | PRG18BB  | PRG21BB  | PRG21BC  |
|---|----------|----------|----------|
| L | 1.6±0.15 | 2.0±0.2  | 2.0±0.2  |
| W | 0.8±0.15 | 1.25±0.2 | 1.25±0.2 |
| T |          |          | 0.9±0.2  |
| e | 0.1-0.6  | 0.2 min. | 0.2 min. |
| b | -        | 0.5 min. | 0.5 min. |

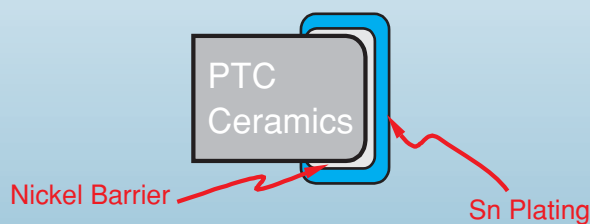


### Multilayer Chip POSISTOR® for Overcurrent Protection



PRG18/21BC Type

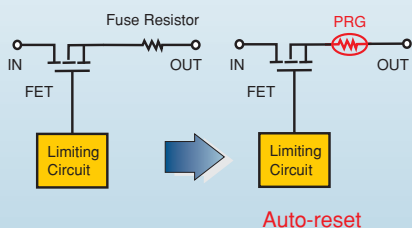
### Electrode Construction Cross-sectional



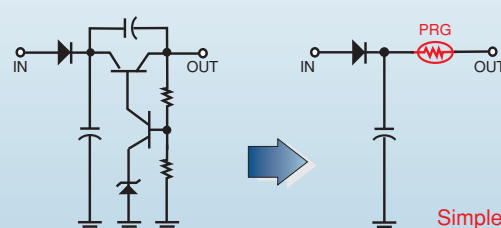
Data here are reference only. Specifications available upon request. Product to be evaluated, confirmed by the user before actual use. Description here may be revised without notice.

## POSISTOR® Ideas

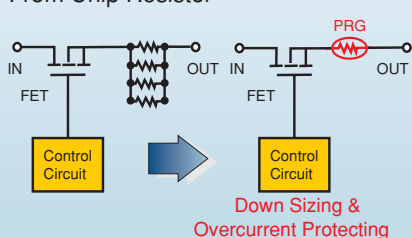
### From Fuse Resistor



### From Current Control Circuit



### From Chip Resistor



| Item   | POSISTOR® | Fuse Resistor | Control Circuit | Chip Resistor |
|--------|-----------|---------------|-----------------|---------------|
| Safety | ○         | ○             | ○               | ✗             |
| Repeat | ○         | ✗             | ○               | ✗             |
| Space  | ○         | ○             | ✗               | ✗             |
| Cost   | △         | △             | ✗               | ○             |

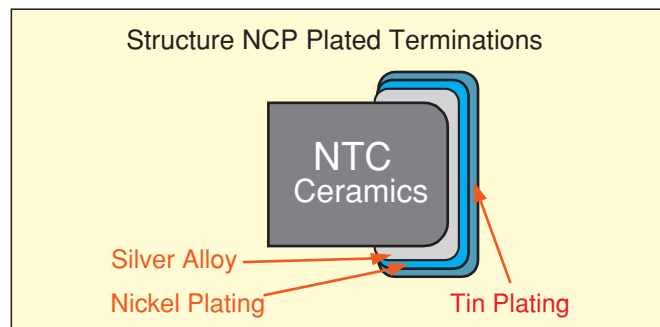
Key: Cross = Bad - Circle = Good - Triangle = Little difference

## Markets & Applications for Overcurrent Protection

| <Product / Use> |                |                         | <POSISTOR® Function>                                                        | <Competitive Devices>          |
|-----------------|----------------|-------------------------|-----------------------------------------------------------------------------|--------------------------------|
| PRG             | Note PC<br>PDA | Rechargeable<br>Battery | Current Limitation & Overcurrent<br>Protection for Trickle Charging Circuit | Chip Resistor                  |
|                 |                |                         | Current Limitation & Overcurrent<br>Protection for Control IC               | Fuse Resistor<br>Chip Resistor |
|                 |                | Mother Board<br>et Al.  | Short-circuit Protection<br>for Signal Line                                 | ---                            |
|                 |                | LCD                     | Short-circuit Protection<br>for LCD Drive Module                            | ---                            |
|                 | TV Game        | DC-DC Converter         | Overcurrent Protection                                                      | Circuit Using Tr               |
|                 | Power Supply   | DC-DC Converter         | Overcurrent Protection<br>for Output Circuit                                | Circuit Using Tr               |
|                 | Car Audio      | Signal Line             | Overcurrent Protection                                                      | Leaded PTC                     |
|                 | Undefined      | Optical Sensor          | Short-circuit Protection<br>for Optical Sensor Driver                       | ---                            |

## Chip NTC Thermistor NCP Series

1. A common relationship between Resistance and B constant in all sizes (0201/ 0402/ 0603/ 0805) offers convenience when downsizing.
2. No lead contained (Pb free).
3. Tight resistance tolerance of  $\pm 1\%$  (Code F) available on 10k ohm (0201, 0402, 0603), 47k ohm (0402, 0603) and 100k ohm (0201, 0402, 0603) products.
4. High soldering heat resistant
5. High humidity resistant due to unique inner electrodes.



| Dimensions     |   | NCP03<br>(0201 size) | NCP15<br>(0402 size) | NCP18<br>(0603 size) | NCP21<br>(0805 size) |
|----------------|---|----------------------|----------------------|----------------------|----------------------|
| <p>(in mm)</p> | L | 0.60±0.03            | 1.00±0.05            | 1.60±0.15            | 2.00±0.20            |
|                | W | 0.3±0.03             | 0.50±0.05            | 0.80±0.15            | 1.25±0.20            |
|                | T |                      |                      |                      | 0.85±0.15            |
|                | e | 0.10-0.20            | 0.15-0.35            | 0.20-0.60            | 0.20-0.70            |

## Line-up of Plated Termination

| Resistance<br>at 25°C | 0201 size NCP03   |             |            |             | 0402 size NCP15   |             |            |             |
|-----------------------|-------------------|-------------|------------|-------------|-------------------|-------------|------------|-------------|
|                       | B-Constant        | Part Number | B-Constant | Part Number | B-Constant        | Part Number | B-Constant | Part Number |
| 11 ohm                | 2750 K            | NCP03YS110* | -          | -           | -                 | -           | -          | -           |
| 22 ohm                | 2750 K            | NCP03YS220* | -          | -           | 3100 K            | NCP15XC220* | -          | -           |
| 33 ohm                | 2750 K            | NCP03YS330* | -          | -           | 3100 K            | NCP15XC330* | -          | -           |
| 47 ohm                | 2750 K            | NCP03YS470* | -          | -           | 3100 K            | NCP15XC470* | -          | -           |
| 68 ohm                | 2750 K            | NCP03YS680* | -          | -           | 3100 K            | NCP15XC680* | -          | -           |
| 100 ohm               | 2750 K            | NCP03YS101* | -          | -           | 3250 K            | NCP15XF101* | -          | -           |
| 150 ohm               | ( 3100 K          | NCP03XC151* | -          | -           | 3250 K            | NCP15XF151* | -          | -           |
| 220 ohm               | ( 3100 K          | NCP03XC221* | -          | -           | 3500 K            | NCP15XM221* | -          | -           |
| 330 ohm               | ( 3100 K          | NCP03XC331* | -          | -           | 3500 K            | NCP15XM331* | -          | -           |
| 470 ohm               | ( 3100 K          | NCP03XC471* | -          | -           | 3650 K            | NCP15XQ471* | -          | -           |
| 680 ohm               | ( 3100 K          | NCP03XC681* | -          | -           | 3650 K            | NCP15XQ681* | -          | -           |
| 1.0k ohm              | 3500 K            | NCP03XM102* | -          | -           | 3650 K            | NCP15XQ102* | -          | -           |
| 1.5k ohm              | 3500 K            | NCP03XM152* | -          | -           | 3950 K            | NCP15XW152* | -          | -           |
| 2.2k ohm              | 3500 K            | NCP03XM222* | -          | -           | 3950 K            | NCP15XW222* | -          | -           |
| 3.3k ohm              | 3500 K            | NCP03XM332* | -          | -           | 3950 K            | NCP15XW332* | -          | -           |
| 4.7k ohm              | 3500 K            | NCP03XM472* | -          | -           | 3500 K            | NCP15XM472* | -          | -           |
| 6.8k ohm              | 3380 K            | NCP03XH682* | -          | -           | 3950 K            | NCP15XW682* | -          | -           |
| 10k ohm               | 3380 K            | NCP03XH103* | 3900 K     | NCP03XV103* | 3380 K            | NCP15XH103* | 3900 K     | NCP15XV103* |
| 15k ohm               | 3380 K            | NCP03XH153* | -          | -           | 3950 K            | NCP15XW153* | -          | -           |
| 22k ohm               | 3380 K            | NCP03XH223* | -          | -           | 3950 K            | NCP15XW223* | 4485 K     | NCP15WL223* |
| 33k ohm               | 4250 K            | NCP03WF333* | -          | -           | 4050 K            | NCP15WB333* | 4485 K     | NCP15WL333* |
| 47k ohm               | 4050 K            | NCP03WB473* | 4485 K     | NCP03WL473* | 4050 K            | NCP15WB473* | 4485 K     | NCP15WL473* |
| 68k ohm               | 4250 K            | NCP03WF683* | 4485 K     | NCP03WL683* | 4150 K            | NCP15WD683* | 4485 K     | NCP15WL683* |
| 100k ohm              | 4250 K            | NCP03WF104* | 4485 K     | NCP03WL104* | 4250 K            | NCP15WF104* | 4485 K     | NCP15WL104* |
| 150k ohm              | -                 | -           | 4485 K     | NCP03WL154* | 4500 K            | NCP15WM154* | 4485 K     | NCP15WL154* |
| 220k ohm              | -                 | -           | 4485 K     | NCP03WL224* | 4500 K            | NCP15WM224* | -          | -           |
| 330k ohm              | -                 | -           | -          | -           | -                 | -           | -          | -           |
| 470k ohm              | -                 | -           | -          | -           | 4500 K            | NCP15WM474* | -          | -           |
| 680k ohm              | -                 | -           | -          | -           | -                 | -           | -          | -           |
| 1.0M ohm              | -                 | -           | -          | -           | -                 | -           | -          | -           |
| Operating Temp.       | -40 to +125°C     |             |            |             | -40 to +125°C     |             |            |             |
| Dissipation Constant  | Approx. 1.0 mW/°C |             |            |             | Approx. 1.0 mW/°C |             |            |             |
| P/N in End            | 05RL              |             |            |             | 03RC              |             |            |             |
| Packaging             | 15 kpcs./reel     |             |            |             | 10 kpcs./reel     |             |            |             |
| Certified UL1434      | -                 |             |            |             | Done              |             | -          |             |

  Recommended types

Coming soon!

\* Resistance tolerance codes: F=±1%, E=±3%, J=±5%

10k ohm, 47k ohm, 100k ohm type have Tight Tolerance Type (±1%: NCP18XH103F03RB, NCP15XH103F03RC, NCP03XH103F05RL, NCP18WB473F10RB, NCP15WB473F03RC, NCP18WF104F12RB, NCP15WF104F03RC, NCP03WF104F05RL)

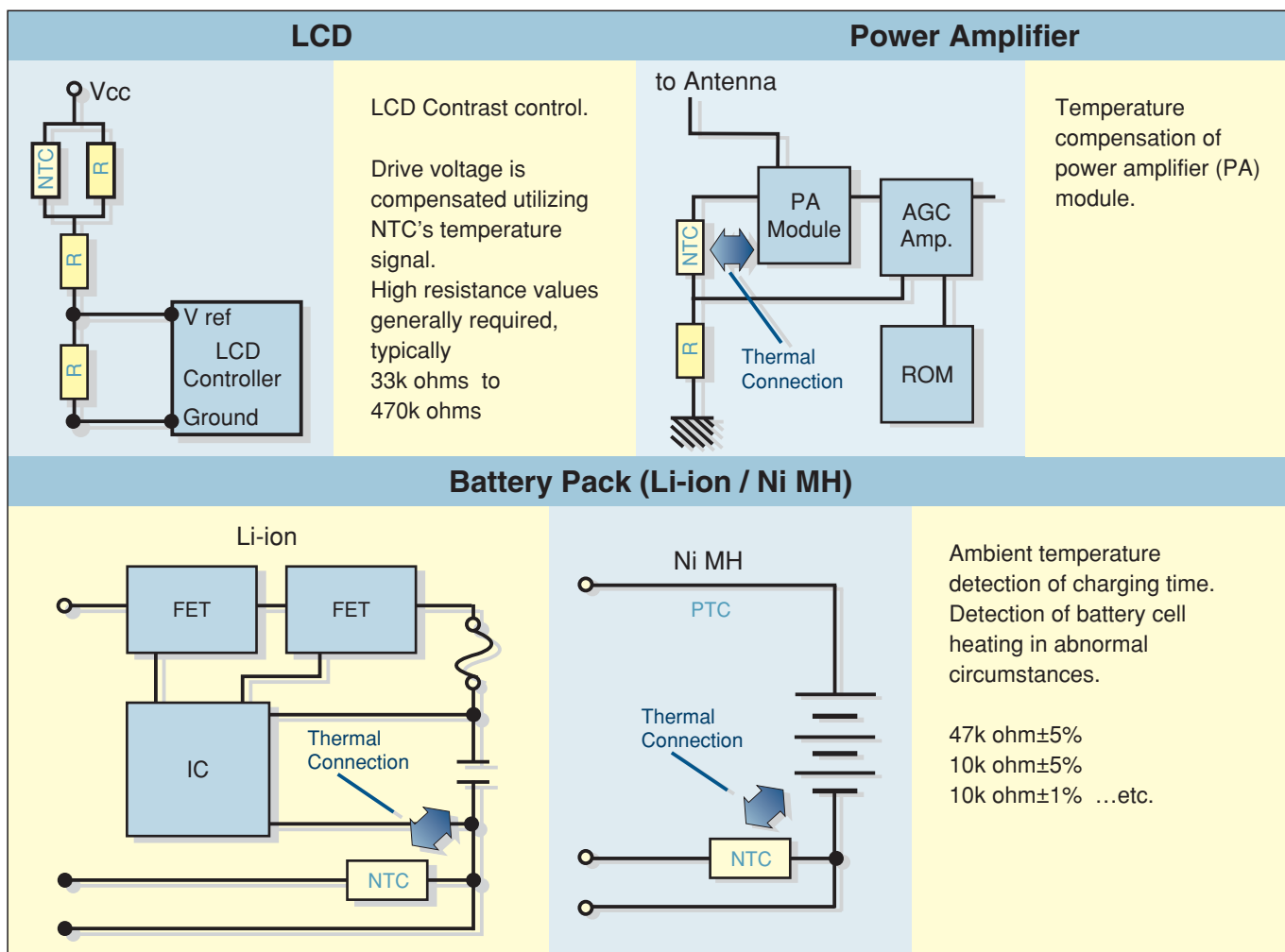
| Resistance<br>at 25°C | 0603 size NCP18   |             |            |             | 0805 size NCP21   |             |
|-----------------------|-------------------|-------------|------------|-------------|-------------------|-------------|
|                       | B-Constant        | Part Number | B-Constant | Part Number | B-Constant        | Part Number |
| 11 ohm                | -                 | -           | -          | -           | -                 | -           |
| 22 ohm                | -                 | -           | -          | -           | -                 | -           |
| 33 ohm                | -                 | -           | -          | -           | -                 | -           |
| 47 ohm                | -                 | -           | -          | -           | -                 | -           |
| 68 ohm                | -                 | -           | -          | -           | -                 | -           |
| 100 ohm               | 3250 K            | NCP18XF101* | -          | -           | -                 | -           |
| 150 ohm               | 3250 K            | NCP18XF151* | -          | -           | -                 | -           |
| 220 ohm               | 3500 K            | NCP18XM221* | -          | -           | 3500 K            | NCP21XM221* |
| 330 ohm               | 3500 K            | NCP18XM331* | -          | -           | -                 | -           |
| 470 ohm               | 3650 K            | NCP18XQ471* | -          | -           | 3650 K            | NCP21XQ471* |
| 680 ohm               | 3650 K            | NCP18XQ681* | -          | -           | -                 | -           |
| 1.0k ohm              | 3650 K            | NCP18XQ102* | -          | -           | 3650 K            | NCP21XQ102* |
| 1.5k ohm              | 3950 K            | NCP18XW152* | -          | -           | -                 | -           |
| 2.2k ohm              | 3950 K            | NCP18XW222* | -          | -           | 3950 K            | NCP21XW222* |
| 3.3k ohm              | 3950 K            | NCP18XW332* | -          | -           | -                 | -           |
| 4.7k ohm              | 3500 K            | NCP18XM472* | -          | -           | 3500 K            | NCP21XM472* |
| 6.8k ohm              | 3950 K            | NCP18XW682* | -          | -           | -                 | -           |
| 10k ohm               | 3380 K            | NCP18XH103* | 3900 K     | NCP18XV103* | 3900 K            | NCP21XV103* |
| 15k ohm               | 3950 K            | NCP18XW153* | -          | -           | 3950 K            | NCP21XW153* |
| 22k ohm               | 3950 K            | NCP18XW223* | -          | -           | 3950 K            | NCP21XW223* |
| 33k ohm               | 4050 K            | NCP18WB333* | -          | -           | 4050 K            | NCP21WB333* |
| 47k ohm               | 4050 K            | NCP18WB473* | -          | -           | 4050 K            | NCP21WB473* |
| 68k ohm               | 4150 K            | NCP18WD683* | -          | -           | -                 | -           |
| 100k ohm              | 4250 K            | NCP18WF104* | -          | -           | 4250 K            | NCP21WF104* |
| 150k ohm              | 4500 K            | NCP18WM154* | -          | -           | -                 | -           |
| 220k ohm              | 4500 K            | NCP18WM224* | -          | -           | -                 | -           |
| 330k ohm              | -                 | -           | -          | -           | -                 | -           |
| 470k ohm              | 4500 K            | NCP18WM474* | -          | -           | -                 | -           |
| 680k ohm              | -                 | -           | -          | -           | -                 | -           |
| 1.0M ohm              | -                 | -           | -          | -           | -                 | -           |
| Operating Temp.       | -40 to +125°C     |             |            |             | -40 to +125°C     |             |
| Dissipation Constant  | Approx. 1.0 mW/°C |             |            |             | Approx. 2.0 mW/°C |             |
| P/N in End            | 03RB              |             |            |             | 03RA              |             |
| Packaging             | 4 kpcs./reel      |             |            |             | 4 kpcs./reel      |             |
| Certified UL1434      | Done              |             |            |             | Done              |             |

     Recommended types

\* Resistance tolerance codes: F=±1%, E=±3%, J=±5%

10k ohm, 47k ohm, 100k ohm type have Tight Tolerance Type (±1%: NCP18XH103F03RB, NCP15XH103F03RC, NCP03XH103F05RL, NCP18WB473F10RB, NCP15WB473F03RC, NCP18WF104F12RB, NCP15WF104F03RC, NCP03WF104F05RL)

## Popular Applications of Chip NTC



## More Popular Applications of Chip NTC



## Temperature Sensor Thermo String Type



| Part Number         | Resistance<br>(25°C)<br>(ohm) | B-Constant<br>(25-50°C)<br>(K) | Operating<br>Temp.<br>(°C) | Dissioation<br>Constant (25°C)<br>(mW) | Operating<br>Temp.<br>(°C) |
|---------------------|-------------------------------|--------------------------------|----------------------------|----------------------------------------|----------------------------|
| NXFT15XH103FA□B□□□□ | 10k                           | 3380                           | -40 to 125                 | 1.5                                    | -20 to 150                 |
| NXFT15WB473FA□B□□□□ | 47k                           | 4050                           | -40 to 125                 | 1.5                                    | -20 to 140                 |
| NXFT15WF104FA□B□□□□ | 100k                          | 4250                           | -40 to 125                 | 1.5                                    | -20 to 130                 |

□ is the filled with lead shape (1: twist, 2: without twist).

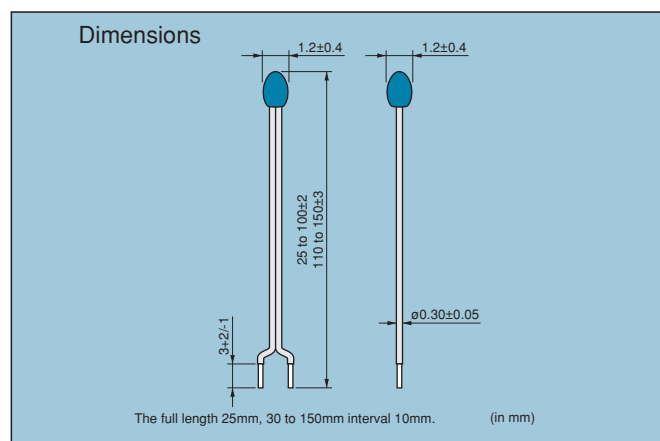
□□□ is the filled with Total-length codes. (25mm, 30 to 150mm interval 10mm, ex. 050=50mm)

Operating Current for Sensor rises Thermistor's temperature by 0.1°C

Rated Electric Power shows the required electric power that causes Thermistor's temperature to rise to 30°C by self heating, at ambient temperature of 25°C.

### Features

1. High accuracy and highly sensitive temperature sensing is mode possible by the small size and high accuracy NTC Thermistor.
2. Narrow space temperature sensing is made possible by the small sensing head and the thin lead wire.
3. Flexibility and a wide variety of lengths (25mm to 150mm) enables the design of flexible temperature sensing architectures.
4. This product is compatible with our 0402 (EIA) size chip Thermistor.
5. Excellent long-term aging stability.
6. This is halogen free product.  
 \* Cl=max. 900ppm, Br=max. 900ppm and  
 Cl+Br=max. 1500ppm
7. NXFT series are recognized by UL/cUL (UL1434, File No. E137188).



**△Note:**

1. Export Control  
 <For customers outside Japan>  
 No Murata products should be used or sold, through any channels, for use in the design, development, production, utilization, maintenance or operation of, or otherwise contribution to (1) any weapons (Weapons of Mass Destruction [nuclear, chemical or biological weapons or missiles] or conventional weapons) or (2) goods or systems specially designed or intended for military end-use or utilization by military end-users.  
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 For products which are controlled items subject to the "Foreign Exchange and Foreign Trade Law" of Japan, the export license specified by the law is required for export.
2. Please contact our sales representatives or product engineers before using the products in this catalog for the applications listed below, which require especially high reliability for the prevention of defects which might directly damage a third party's life, body or property, or when one of our products is intended for use in applications other than those specified in this catalog.
 

|                             |                                                                                                      |
|-----------------------------|------------------------------------------------------------------------------------------------------|
| ① Aircraft equipment        | ② Aerospace equipment                                                                                |
| ③ Undersea equipment        | ④ Power plant equipment                                                                              |
| ⑤ Medical equipment         | ⑥ Transportation equipment (vehicles, trains, ships, etc.)                                           |
| ⑦ Traffic signal equipment  | ⑧ Disaster prevention / crime prevention equipment                                                   |
| ⑨ Data-processing equipment | ⑩ Application of similar complexity and/or reliability requirements to the applications listed above |
3. Product specifications in this catalog are as of July 2011. They are subject to change or our products in it may be discontinued without advance notice. Please check with our sales representatives or product engineers before ordering. If there are any questions, please contact our sales representatives or product engineers.
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5. This catalog has only typical specifications because there is no space for detailed specifications. Therefore, please review our product specifications or consult the approval sheet for product specifications before ordering.
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