

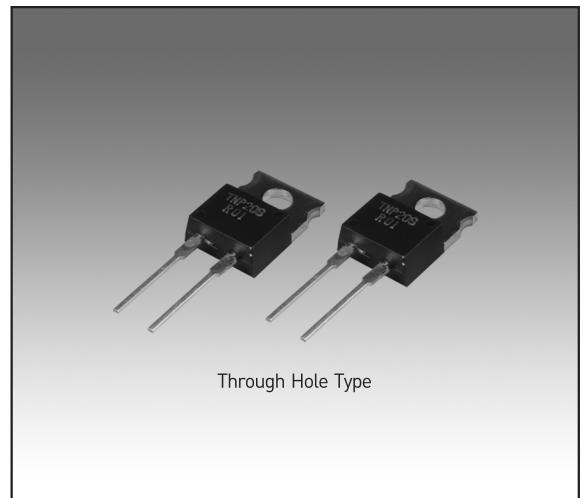
## Power Thin Film Resistors (TO220)

This series of TO-220 resistors offers many possibilities. The TNP10 in TO220 style molded package for throughhole(20W)and surface mount(10W). The TNP20S in TO220 style molded package for throughhole(35W) and surface mount(20W). The TNP50U in TO220 style molded package for throughhole and surface mount. This model has a large resistance range of 10mΩ to 51kΩ. The TNP10 is suitable for high frequency applications and high-speed pulse circuits. The TNP20S is suitable for power units of machines, motor control, drive circuits, automobiles and measurements. The TNP50U's low 2.3 /W heat resistance from the resistor hot spot to the flange is made possible with thin film metallization technology. All of these models are non-inductive and offer excellent heat dissipation.

Applications include: UPS, power units of machines, motor control, drive circuits, automotive, measurements, industrial computers and high frequency electronics

### GENERAL SPECIFICATIONS

| Model  | Resistance Range [Ω] | TCR [ppm/°C] | Tolerance(%)   | Power Rating [See Note 1] | Heat Resistance [See Note 2] |
|--------|----------------------|--------------|----------------|---------------------------|------------------------------|
| TNP10  | 0.02 to 0.091        | ±250         | J [±5]         | 20W<br>1W (In Free Air)   | 5.9°C/W                      |
|        | 0.1 to 9.1           | ±100         | F [±1], J [±5] |                           |                              |
|        | 10 to 51K            | ±50          | F [±1]         |                           |                              |
| TNP20S | 0.02 to 0.091        | ±250         | J [±5]         | 35W<br>1W (In Free Air)   | 3.3°C/W                      |
|        | 0.1 to 9.1           | ±100         | J [±5], F [±1] |                           |                              |
|        | 10 to 51K            | ±50          | F [±1]         |                           |                              |
| TNP50U | 0.01 to 0.091        | ±250         | J [±5]         | 50W<br>1W (In Free Air)   | 2.3°C/W                      |
|        | 0.1 to 9.1           | ±100         | J [±5], F [±1] |                           |                              |
|        | 10 to 51K            | ±50          | F [±1]         |                           |                              |



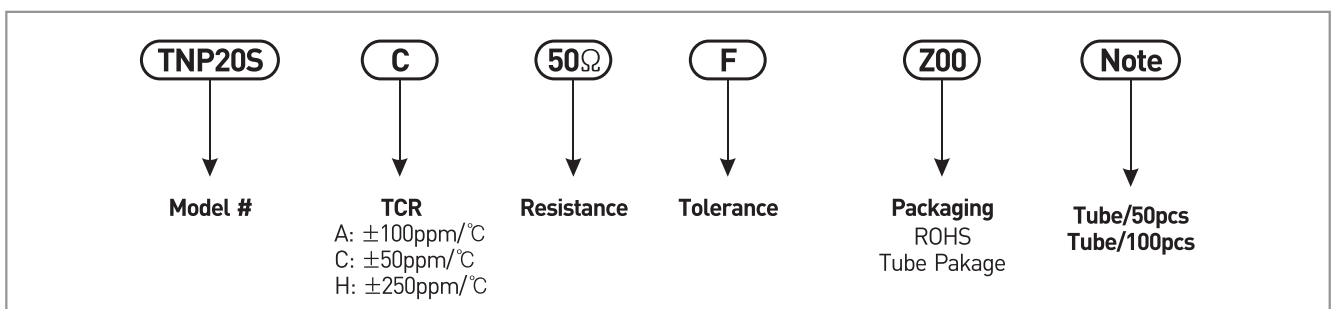
Note: 1) Rating power: Flange temperature of -55°C to +25°C  
2) From hot spot to flange

### CHARACTERISTICS

Values in [ ] mean change in Ω after test

|                                 |                       |  |
|---------------------------------|-----------------------|--|
| Temperature Range               |                       | -55°C ~ +155°C                                       |
| Insulation Resistance           | [Over 1000 MΩ]        | Between terminals and flange                         |
| Dielectric Withstanding Voltage | [AC 2000V]            | Between terminals and flange or 60 seconds           |
| Moisture Resistance             | ±[1.0%]               | 40°C, 90 to 95% RH, DC 0.1 x Power rating, 1000hours |
| Soldering Heat                  | ±[0.1%]               | 350±5°C, 3seconds                                    |
| Solderability                   | [Over 95% of surface] | 230±5°C, 3seconds                                    |
| Vibration                       | ±[0.25%]              | IEC 60068-2-6  |
| Temperature Cycle               | ±[0.25%]              | -55°C 30minutes + 155°C 30minutes 5cycles            |
| Working Voltage                 |                       | 500V or $\sqrt{P \times R}$                          |
| Load Life                       | ±[1.0%]               | 25°C, 90minutes on, 30minutes off, 1000hours         |

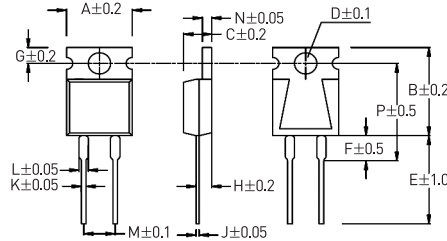
### ORDERING PROCEDURE EXAMPLE



## DIMENSIONS [mm]

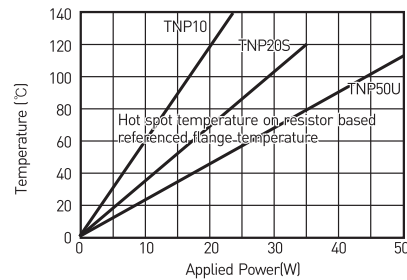
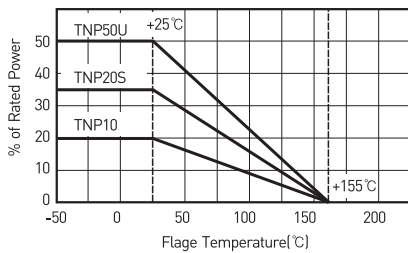
### TNP10, TNP20S, TNP50U

Through-hole type



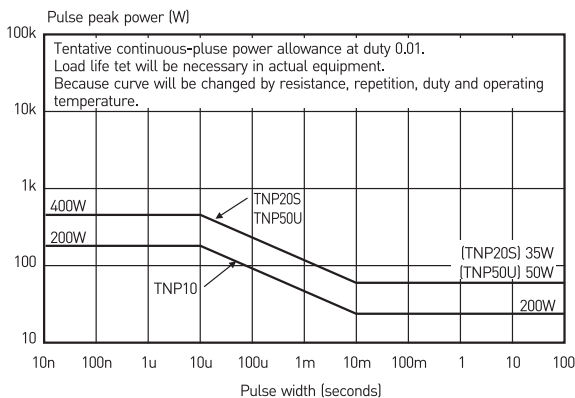
| Model  | A    | B    | C   | D   | E    | F   | G   | H    | J   | K    | L   | M    | N   | P    |
|--------|------|------|-----|-----|------|-----|-----|------|-----|------|-----|------|-----|------|
| TNP10  | 10.1 | 15.0 | 4.5 | 3.6 | 15.5 | 4.0 | 3.0 | 2.75 | 0.5 | 0.75 | 1.5 | 5.08 | 1.5 | 16.0 |
| TNP20S | 10.1 | 15.0 | 4.5 | 3.6 | 15.5 | 4.0 | 3.0 | 2.75 | 0.5 | 0.75 | 1.5 | 5.08 | 1.5 | 16.0 |
| TNP50U | 10.1 | 15.0 | 4.5 | 3.6 | 15.5 | 4.0 | 3.0 | 2.75 | 0.5 | 0.75 | 1.5 | 5.08 | 1.5 | 16.0 |

## DERATING CURVES AND TEMPERATURE RISING CURVES



## PULSE ENERGY DURABILITY

### TNP10, TNP20S, TNP50U

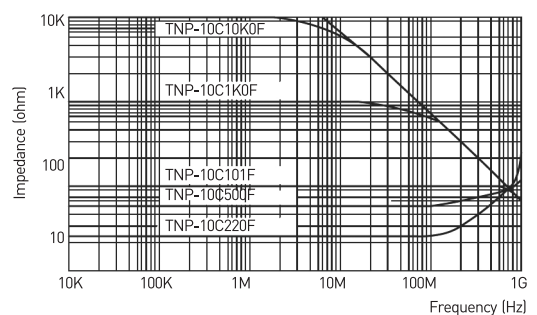


Note:

- Insulation material is unnecessary between flange and heat-sink, flange and resistor is separated by alumina substrate.
- Resistance measurement shall be made at a point 5.27mm±0.6mm from the resistor body.
- TCR of low resistance will be increased as 300ppm/0.02ohm, 200ppm/0.05ohm, 140ppm/0.1ohm and 80ppm/0.2ohm typically. Testing point is at 5.27mm from bottom of molding of terminals.
- Test method is IEC60068-2-6, and specification is sine sweep wave form, 100Hz-2000Hz, 10 cycles, amplitude 0.75mm or 100m/s<sup>2</sup> 90minutes. direction x-y-z, Amplitude 0.75mm will be applied under break point Frequency (about 60Hz) and 100m/s<sup>2</sup> over break point
- When mounting resistor on heat-sink by screw, clip and pressure strip with using heat conduction grease on back side of resistor are recommended. Recommended screw torque is 0.5-0.6Nm.
- Standard packaging is anti-static PE tray, which contains 100pcs/tray.

## FREQUENCY CHARACTERISTICS

### TNP10



### TNP20S, TNP50U

