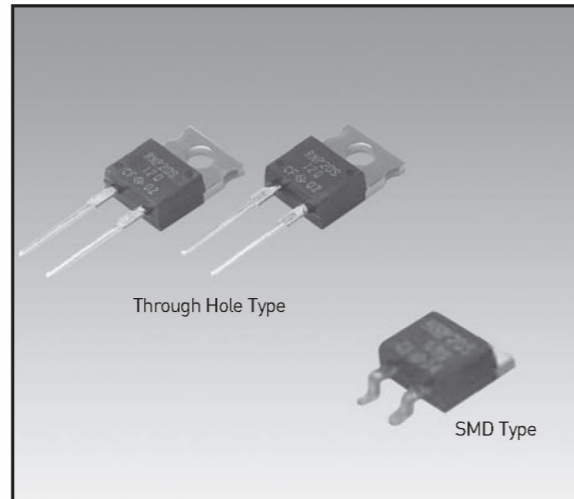


# Power Thin Film Resistors(TO220)

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 application and high-speed pulse circuits. The TNP20S is suitable for power unit 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.

## GENERAL SPECIFICATIONS

Model	Resistance Range [Ω]	TCR [ppm/°C]	Tolerance(%)	Power Rating [See Note 1]	Heat Resistance [See Note 1]
TNP10	0.01 to 0.091	±250	J [±5]	20W 10W(SMD) 1W (At Free Air)	5.9°C/W
	0.1 to 9.1	±100	F [±1], J [±5]		
	10 to 51K	±50	F [±1]		
TNP20S	0.01 to 0.091	±250	J [±5]	35W 1W (At 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 1W (At Free Air)	2.3°C/W
	0.1 to 9.1	±100	J [±5], F [±1]		
	10 to 51K	±50	F [±1]		



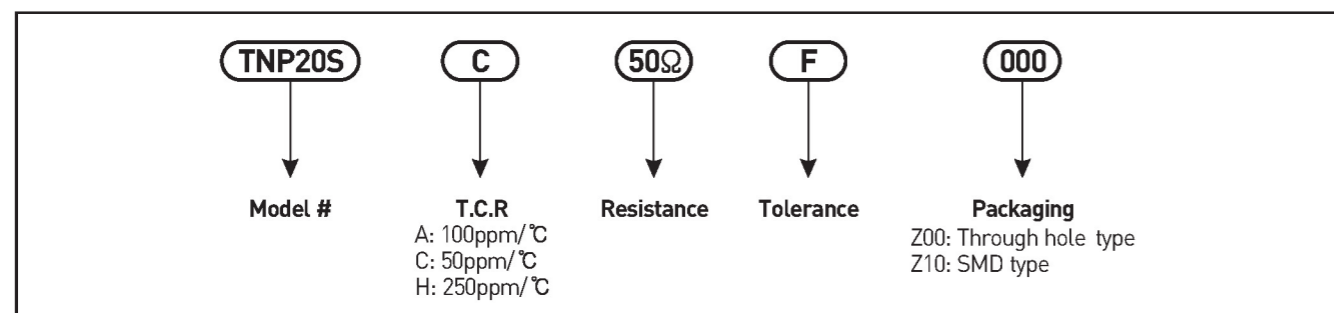
Note: 1) Rating power: Flange Temperature of -55 to +25°C  
2) From hot spot to Flange

## CHARACTERISTICS

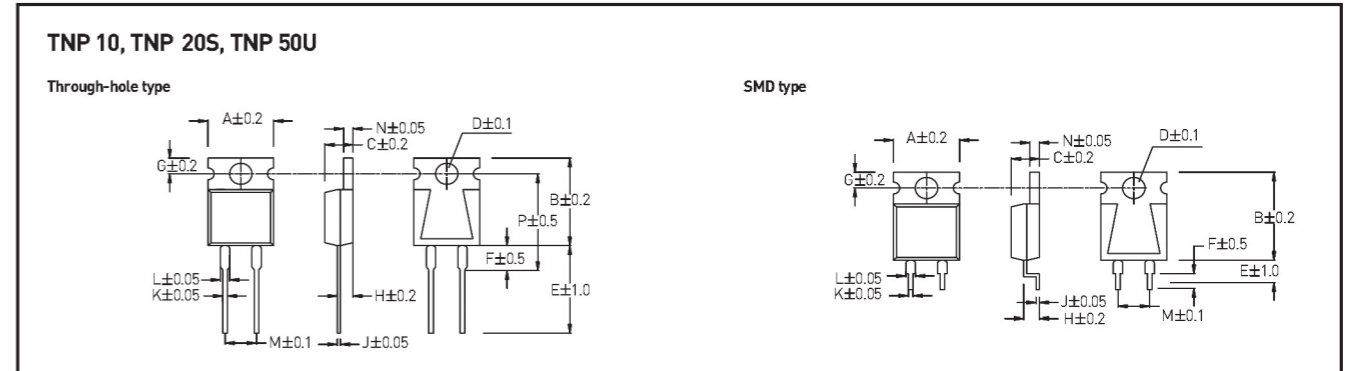
Values in [ ] mean change in Ω after test

Temperature Range	-55°C to +155°C	
Insulation Resistance	[Over 1000 MΩ]	Between terminals and flange
Dielectric Withstanding Voltage	[2000 Volt AC]	Between terminals and flange or 60 sec.
Moisture Resistance	±[1.0%]	40°C, 90 to 95% RH, DC 0.1W, 1000hours
Soldering Heat	±[0.1%]	350±5°C, 3sec.
Solderability	[Over 95% of surface]	250±5°C, 3sec.
Vibration	±[0.25%]	IEC 60068-2-6
Temperature Cycle	±[0.25%]	-55°C 30minutes + 155°C 30minutes 5cycle
Working Voltage		500V or sqrt P x R
Load Life	±[1.0%]	25°C, 90minutes on, 30minutes off, 1000hours

## ORDERING PROCEDURE EXAMPLE

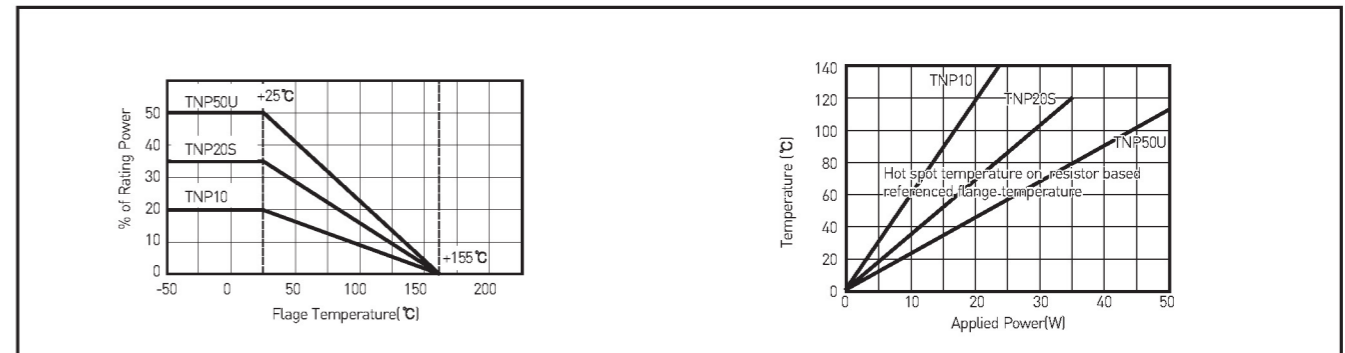


## DIMENSIONS(mm) AND STRUCTURE

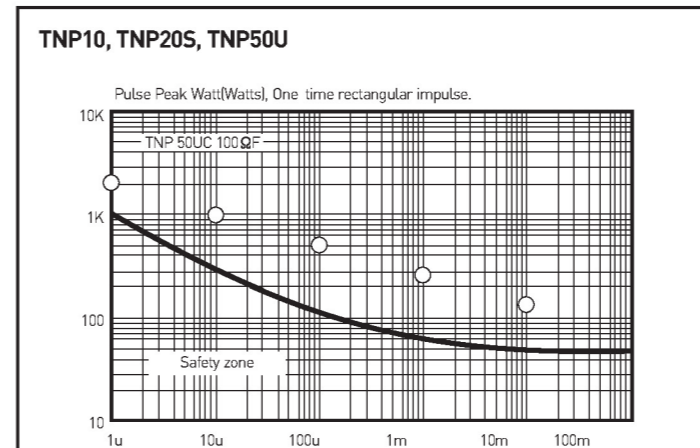


Model	A	B	C	D	E	F	G	H	J	K	L	M	N	P
TNP10	10.1	15.0	4.5	3.6	15.5	4.0	3.0	2.75	0.5	0.75	1.5	5.08	1.5	16.0
TNP20S	10.1	15.0	4.5	3.6	15.5	4.0	3.0	2.75	0.5	0.75	1.5	5.08	1.5	16.0
TNP50U	10.1	15.0	4.5	3.6	15.5	4.0	3.0	2.75	0.5	0.75	1.5	5.08	1.5	16.0

## DERATING CURVES AND TEMP RISE CURVES



## PULSE ENERGY DURABILITY



- 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/s² 90minutes, direction x-y-z, Amplitude 0.75mm will be applied under break point Frequency(about 60Hz) and 100m/s² 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.

## P FREQUENCY CHARACTERISTICS

