

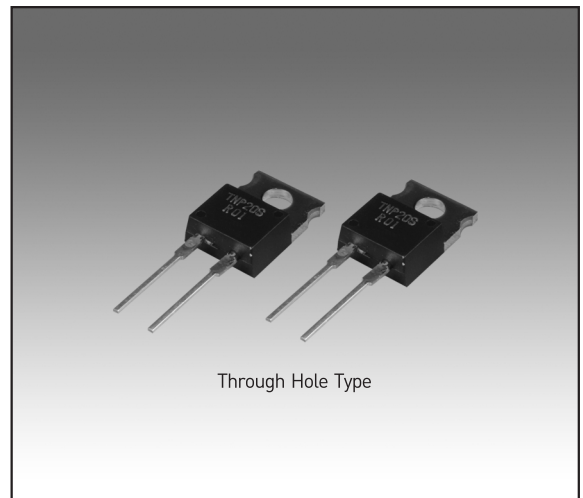
Power Thin Film Resistors (TO220)

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 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 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 1W (In Free Air)	2.3°C/W
	0.1 to 9.1	±100	J [±5], F [±1]		
	10 to 51K	±50	F [±1]		



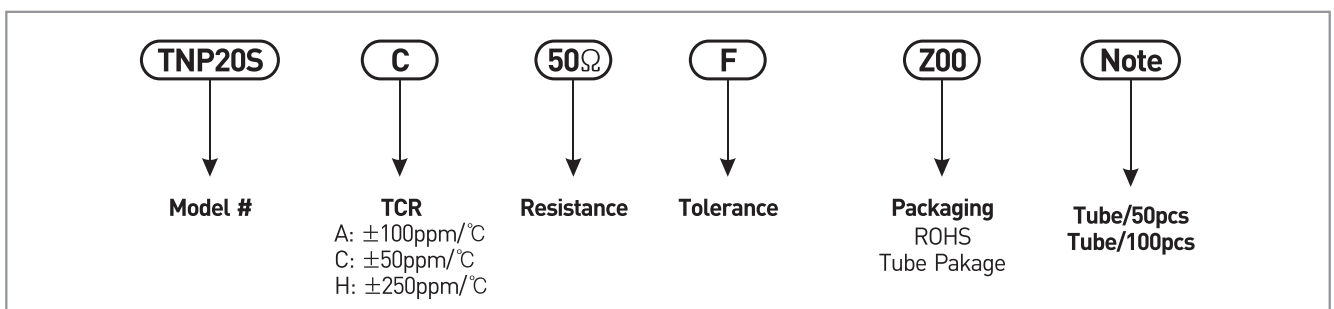
Note: 1) Rating power: Flange temperature of -55°C to +25°C
2) From hot spot to flange

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

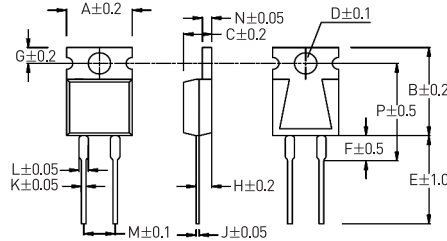
ORDERING PROCEDURE EXAMPLE



DIMENSIONS [mm]

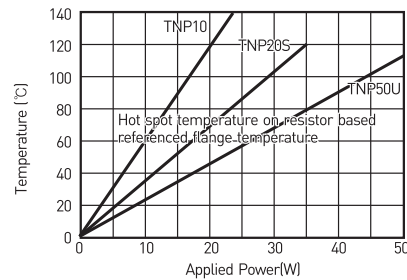
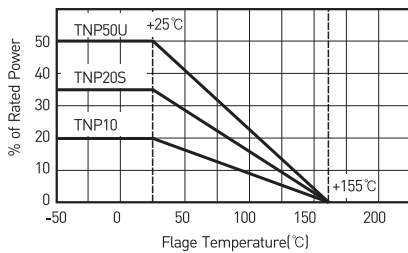
TNP10, TNP20S, TNP50U

Through-hole type



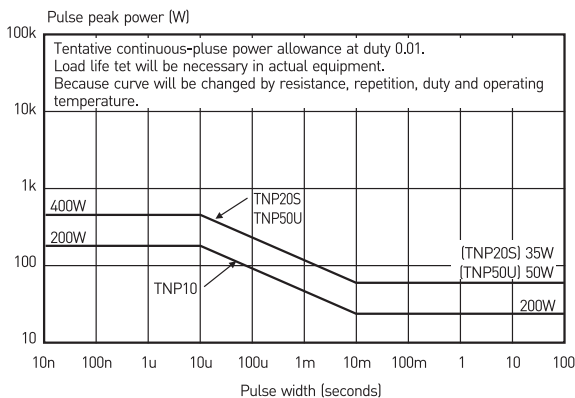
Model	A	B	C	D	E	F	G	H	J	K	L	M	N	P
TNP10	10.1	15.0	4.5	3.6	15.5	4.0	3.0	2.75	0.5	0.75	1.5	5.08	1.5	16.0
TNP20S	10.1	15.0	4.5	3.6	15.5	4.0	3.0	2.75	0.5	0.75	1.5	5.08	1.5	16.0
TNP50U	10.1	15.0	4.5	3.6	15.5	4.0	3.0	2.75	0.5	0.75	1.5	5.08	1.5	16.0

DERATING CURVES AND TEMPERATURE RISING CURVES



PULSE ENERGY DURABILITY

TNP10, TNP20S, TNP50U

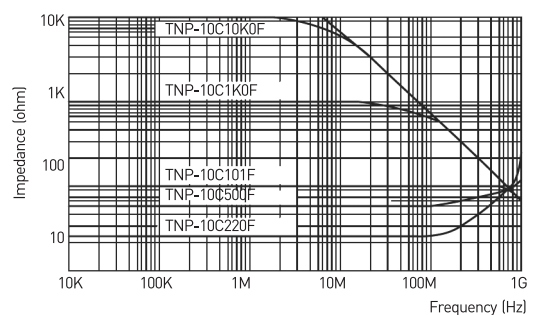


Note:

- 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 $5.27\text{mm} \pm 0.6\text{mm}$ 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^2 90minutes. direction x-y-z, Amplitude 0.75mm will be applied under break point Frequency (about 60Hz) and 100m/s^2 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

