



# NIKKOHM POWER RESISTOR

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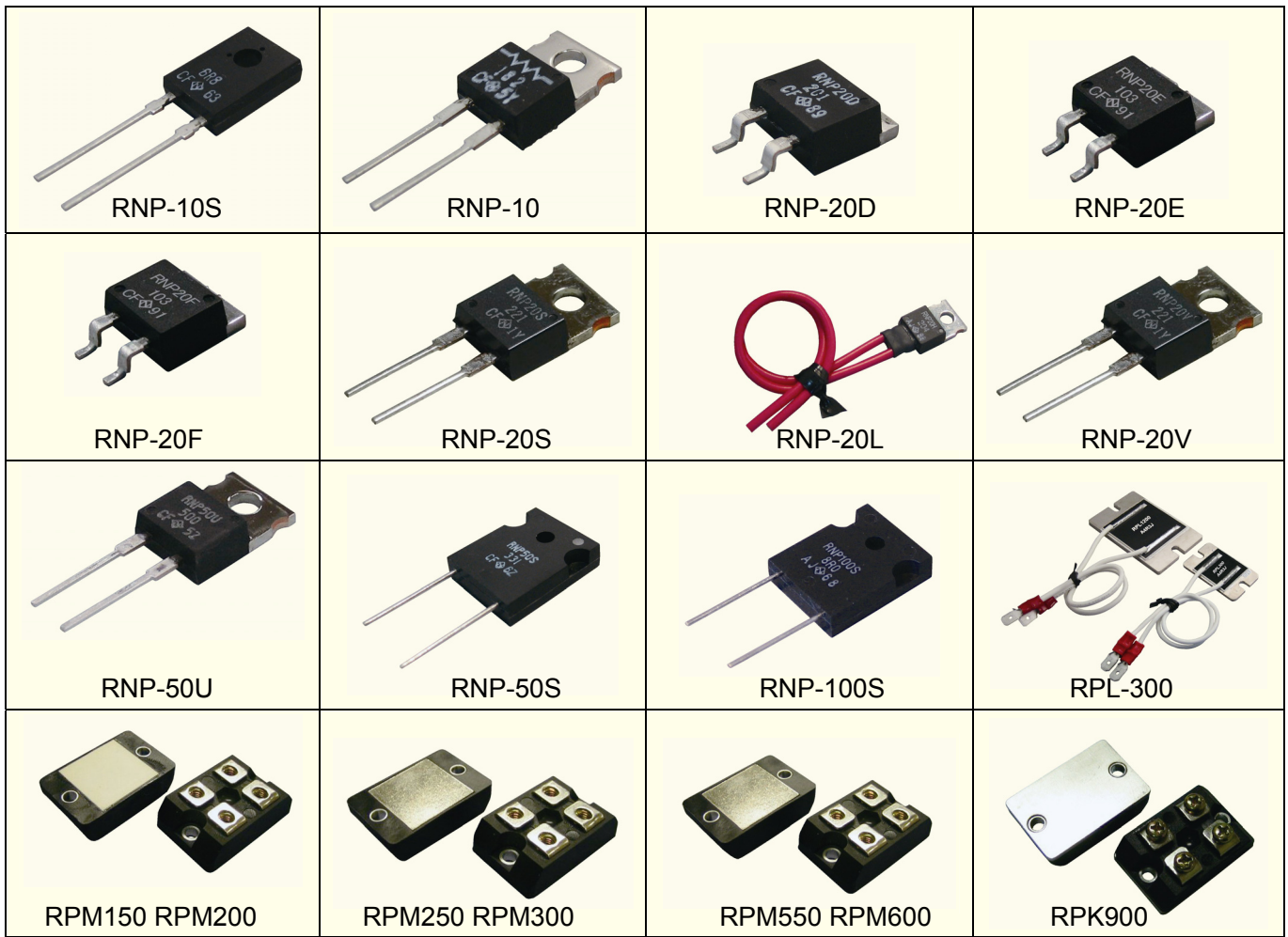
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# Power Resistor

P/N	Rated Power	Style	Heat Resistance deg C/W	Resistance Range	Tolerance	Parallel Cap.	Series Ind.	Withstand Voltage	Weight	Packaging	Features
RNP-10S	20W	TO126	5.9 deg C/W	0.02 - 51kΩ	1%, 5%	1.00pF	8.22nH	2kVAC	0.85 g	60pcs/tube	standard
RNP-10	20W	TO220	5.9 deg C/W	0.02 - 51kΩ	1%, 5%	1.15pF	8.38nH	2kVAC	2.07 g	50pcs/tube	Standard
RNP-20D	35W	TO263	3.3 deg C/W	0.02 - 51kΩ	1%, 5%	1.44pF	8.38nH	2kVAC	1.53 g	500pcs/reel	DPAK SMD, Ni
RNP-20E	35W	TO263	3.3 deg C/W	0.02 - 51kΩ	1%, 5%	1.44pF	8.38nH	2kVAC	1.53 g	500pcs/reel	DPAK SMD, matte Tin
RNP-20F	35W	TO263	3.3 deg C/W	0.02 - 51kΩ	1%, 5%	1.44pF	8.38nH	2kVAC	1.53 g	500pcs/reel	DPAK SMD, matte Tin
RNP-20S	35W	TO220	3.3 deg C/W	0.02 - 51kΩ	1%, 5%	1.44pF	8.38nH	2kVAC	2.07 g	50pcs/tube	Standard
RMP-20S	35W	---	3.3 deg C/W	0.02 - 51kΩ	1%, 5%	1.44pF	8.38nH	2kVAC	2.00g	50pcs/tube	SMD with flange and screw hole
RNP-20L	35W	TO220	3.3 deg C/W	0.02 - 51kΩ	1%, 5%	1.44pF	8.38nH	2kVAC	2.07 g	Bulk	Leads bent TO220
RNP-20V	35W	TO220	3.3 deg C/W	0.02 - 51kΩ	1%, 5%	1.44pF	8.38nH	6kVAC	2.07 g	50pcs/tube	High volt insulation
RNP-20W	35W	---	3.3 deg C/W	0.1 - 200kΩ	1%, 5%	---	---	4kVAC	2.40g	Bulk	Flying leads
RNP-50U	50W	TO220	2.3 deg C/W	0.02 - 51kΩ	1%, 5%	1.69pF	9.65nH	2kVAC	2.07 g	50pcs/tube	Standard
RNP-50S	100W	TO247	1.3 deg C/W	0.02 - 51kΩ	1%, 5%	2.35pF	11.72nH	2kVAC	6.4 g	50pcs/tray	Wire leads
RNP-100S	140W	TO247	0.9 deg C/W	0.02 - 51kΩ	1%, 5%	3.68pF	12.52nH	2kVAC	6.4 g	50pcs/tray	Wire leads
RPM150X RPM150Y	150W	SOT227	0.5degC/W	0.1 - 100kΩ	5%	13.10pF	13.67nH	2.5kVAC	20 g	Bulk	2- separated, 2- tapped
RPM200X RPM200Y RPM200Z	200W	SOT227	0.5degC/W	0.1 - 100kΩ	5%	13.10pF	13.67nH	2.5kVAC	20 g	Bulk	Single
RPM250X RPM250Y	250W	SOT227	0.32degC/W	0.1 - 100kΩ	5%	13.10pF	13.67nH	2.5kVAC	30 g	Bulk	2- separated, 2- tapped
RPM300X RPM300Y RPM300Z	300W	SOT227	0.32degC/W	0.1 - 100kΩ	5%	13.10pF	13.67nH	2.5kVAC	30 g	Bulk	Single
RPM550X RPM550Y	550W	SOT227	0.11degC/W	50 - 1kΩ	5%	13.10pF	13.67nH	2.5kVAC	30 g	Bulk	2- separated, 2- tapped
RPM600X RPM600Y RPM600Z	600W	SOT227	0.11degC/W	50 - 1kΩ	5%	13.10pF	13.67nH	2.5kVAC	30 g	Bulk	Single
RPG250	250W	SOT227	0.32degC/W	0.1 - 100kΩ	5%	13.10pF	13.67nH	2.5kVAC	38 g	Bulk	2- separated
RPG300	300W	SOT227	0.32degC/W	0.1 - 100kΩ	5%	13.10pF	13.67nH	2.5kVAC	38 g	Bulk	Single
RPK600	900W	SOT227	0.11degC/W	50 - 1kΩ	5%	13.10pF	13.67nH	2.5kVAC	38 g	Bulk	2- separated
RPK900	900W	SOT227	0.11degC/W	50 - 1kΩ	5%	13.10pF	13.67nH	2.5kVAC	38 g	Bulk	Single
RPL250	250W	---	0.32degC/W	0.1 - 100kΩ	5%	---	---	2.0kVAC	20g	Bulk	Flying leads
RPL300	300W	---	0.32degC/W	0.1 - 100kΩ	5%	---	---	2.0kVAC	20g	Bulk	Flying leads
RPL1200	1200W	---	0.10degC/W	0.1 - 100kΩ	5%	---	---	2.0kVAC	80g	Bulk	Flying leads



# Power Resistor



## Standard Resistance Value

Nominal resistance value shows with two significant digits. Marking will be done just like R02, R10, 1R0, 100, 101 for 0.02ohm, 0.1ohm 1.0ohm, 10ohm or 100ohm.

E12+	E24+	
1.0	1.0	3.3
1.2	1.1	3.6
1.5	1.2	3.9
1.8	1.3	4.3
2.2	1.5	4.7
2.7	1.6	(5.0)
3.3	1.8	5.1
3.9	2.0	5.6
4.7	2.2	6.2
(5.0)	2.4	6.8
5.6	(2.5)	7.5
6.8	2.7	8.2

## TCR and Tolerance

TCR	Code	Tolerance	Code
>+/-250ppm/C	H	+/-0.1%	B
+/-100ppm/C	A	+/-1.0%	F
+/-50ppm/C	C	+/-5.0%	J

Standard TCR is over 250ppm/deg C at 0.02-0.082ohm, 100ppm/degC at 0.1-10ohm and 50ppm/deg C over 10ohm.

## Ordering and Packaging

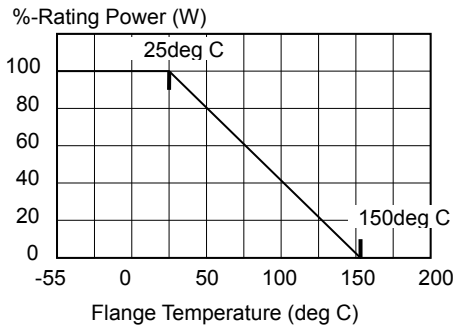
p/n: RNP-20SC100ohmFZ00

Type	TC	Resistance	Tol	Code	Pack
RNP-20S	H	0.05ohm	J	Z00	Tube
RNP-20S	A	5.0ohm	F	Z00	Tube
RNP-20S	C	10ohm	F	Z00	Tube
RNP-20F	C	100ohm	F	Z00	Tube
RNP-20F	C	100ohm	F	Z01	Tape
RPM300X	A	0.1ohm	J	Z00	Bulk
RPM300Y	A	1.0ohm	J	Z00	Bulk
RPM300Z	A	10ohm	J	Z00	Bulk
RPM550X	A	10+10ohm	J	Z00	Bulk
RPM550Y	A	100+100ohm	J	Z00	Bulk

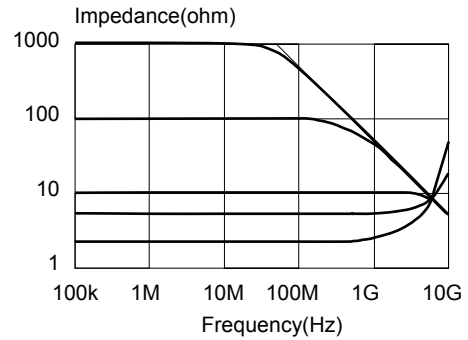
- (1) 500pcs / reel taping is available at RNP-20D, RNP-20E, RNP-20F.
- (2) 60pcs/tube packaging is standard at RNP-10S and 50pcs/tube is standard at RNP-10, RNP-20S, RNP-20D, RNP-20E, RNP-20F and RNP-50U.
- (3) 50pcs/tray is standard at RNP-50S and RNP-100S.

# Power Resistor

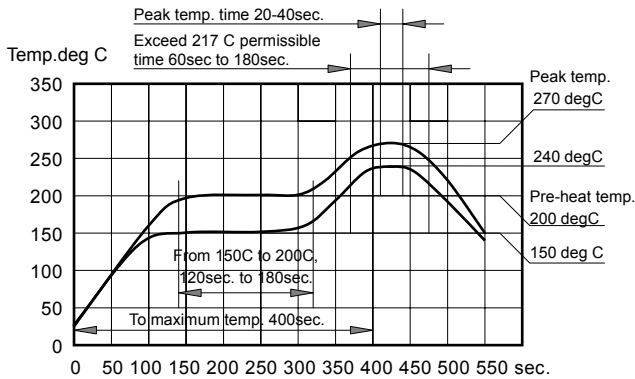
## Delating (for all type)



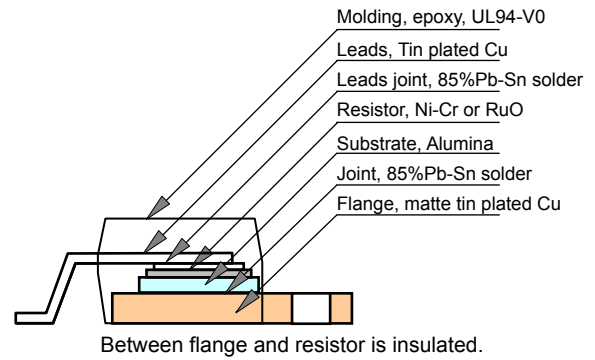
## Frequency Characteristics, RNP-20S



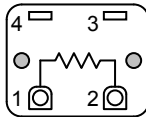
## Reflow Profile, RNP-20F



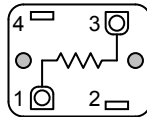
## Structure and Material, RNP-20F



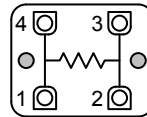
## Schematics



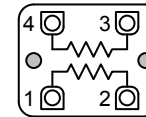
RPM200X  
RPM300X  
RPM600X



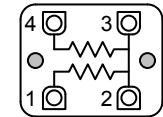
RPM200Y  
RPM300Y  
RPM600Y



RPM200Z  
RPM300Z  
RPM600Z



RPM150X  
RPM250X  
RPM550X



RPM150Y  
RPM250Y  
RPM550Y

## Cooling Calculation, Flanged Power Resistor

Flanged resistor shall be attached directly on proper heat-sink without insulator sheet. Heat will be transferred from resistive film to ambient air thru substrate and flange.  
Thermal resistance of each resistor,  $R_r$  is shown in each specification. Applied power  $P$ , heat resistance of resistor  $R_r$ , thermal resistance of heat-sink  $R_h$ , ambient temperature  $T_a$  will determine temperature  $T_r$  of resistive film under operation.

$$T_h = P \times R_h + T_a \dots \dots \dots (^\circ\text{C})$$

$$T_r = P \times R_r + T_h \dots \dots \dots (^\circ\text{C})$$

then;

$$T_r = P \times R_r + P \times R_h + T_a \dots \dots \dots (^\circ\text{C})$$

Resistive film temperature  $T_r$  shall be limited under 155 deg C in operation. In case of RNP-20S,  $T_a$  equals to 35 deg C,  $R_r$  3.3 deg C/W,  $R_h$  0.2degC/W and  $P=35W$ , resistive film temperature  $T_r$  will be 147.5 deg C (122.5+25). This film temperature shows the value almost near the temperature 155 deg C of a limit. When above condition, flange temperature will be 32 deg C. Rated power 35W is defined under less than 25 deg C flange temperature. Lower temperature design insures to realize long life power circuit.

