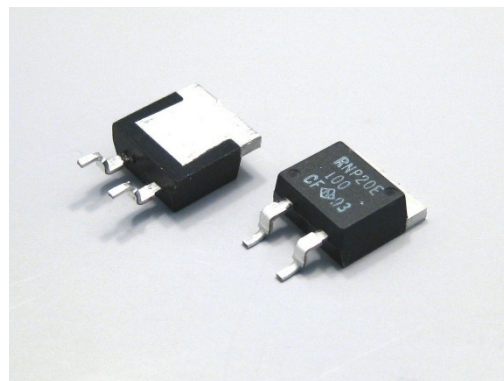


TO263 50W HIGH POWER RESISTORS

RNP-50E/RNP-50F

Features

- 50W Power rating, TO263 (D2PAK) package
- AEC-Q200 Grade, RoHS 2 compliant
- UL94 V-0 certified material
- 175°C maximum operating temperature
- Heat Resistance 2.3°C/W
- Surface Mounting Resistor
- Supports reflow and wave soldering



Applications

- Power Supply Units
- Motor-Driven Equipment
- Inverter Circuit
- Automotive Electronical Equipment
- Electronic Load Device
- UPS
- Testing/Measuring Equipment
- Filter
- Bleeder
- Snubber
- Damping Resistor

Model	TCR*	Resistance	Tolerance	Packaging
RNP-50E	C	E24	F	Z03

Model	TCR (ppm/°C)	Symbol	Value Range (Ohms)	Tolerance (%)	Symbol	Packaging	Symbol
RNP-50E	50	C	10~51k	1	F	500pcs/tape reel	Z01
RNP-50F	100	A	0.1~510k	5	J	50pcs/PVC stick	Z03
	150	P	560k~1M				
	250	H	0.01~0.09				

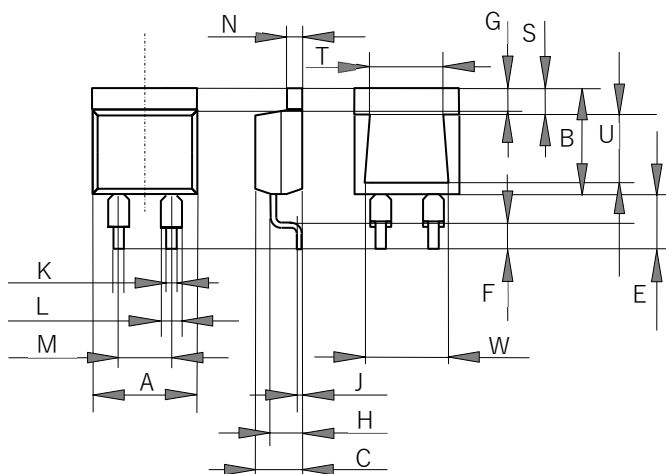
Ordering Information

Resistance value (*) is available following modified E24, +E24.

1.0	1.1	1.2	1.3	1.5	1.6	1.8	2.0	2.2	2.4	2.5	2.7	3.0	3.3
3.6	3.9	4.0	4.3	4.7	5.0	5.1	5.6	6.2	6.8	7.5	8.0	8.2	9.1

*TCR and tolerance are determined by the resistance value.

Dimensional Specifications (mm)



記号	単位 : mm
A	10.1+/-0.2
B	10.3+/-0.2
C	4.5+/-0.2
E	5.0+/-0.5
F	2.5+/-0.25
G	2.2+/-0.2
H	2.75+/-0.2
J	0.5+/-0.05
K	0.75+/-0.05
L	1.5+/-0.05
M	5.08+/-0.1
N	1.5+/-0.05
S	(2.5)
T	7.0+/-0.1
U	5.8+/-0.1
W	7.6+/-0.1

Specifications

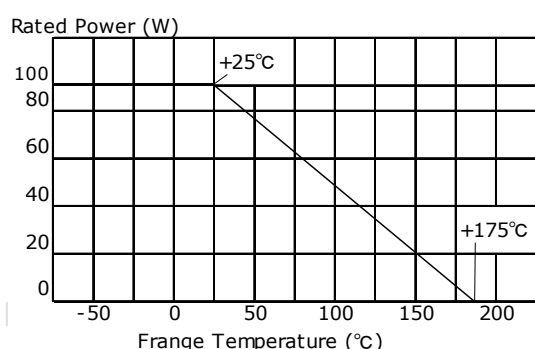
Parameter	Values / Specifications	Test Conditions
Rated Power	50 W	-55°C to 25°C at flange
Rated Power	2.0 W	Free air
Max. Operating Volt.	Smaller value either 500V or $\sqrt{P \cdot R}$	Maximum input current: 20A
Operation Temperature Range	-55 °C~+175 °C	-

Note: In some of high ohmic and low ohmic cases, the rated power cannot be input due to the limitation of the maximum operation voltage or current value. Please use under 500V in the case over 7k Ohms. Please use below 20A in the case under 0.1 Ohms.

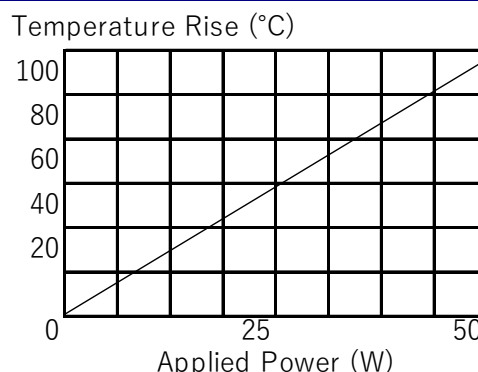
Reliability

Parameter	Values / Specifications	Test Conditions
Heat Resistance	2.3 °C/W	Between resistive material and flange *Typical value
Capacitance	1.69 pF	Between terminal and flange *Typical value
Inductance	9.65 nH	Between terminals *Typical value
Insulation Resistance	$\geq 1,000$ Mohm	Between terminal and flange
Insulation Voltage	$\geq 2,000$ VAC	Between terminal and flange, 1min.
Weight	1.5 g	-
High Temperature Exposure (Storage)	+/- (1.00 % + 0.05ohm)	AEC-Q200 No.3 +175 °C, 1,000 hours, 77pcs
Temp. Cycle	+/- (1.00 % + 0.05ohm)	AEC-Q200 No.4 -55 °C 30min. +125 °C 30min. 77pcs 1,000 cycles
Moisture Resistance	+/- (1.00 % + 0.05ohm)	AEC-Q200 No.6 +85 °C, 85 %RH, 1,000 hours, 0.1 W, 77pcs
High Temperature Operating Life	+/- (1.00 % + 0.05ohm)	AEC-Q200 No.8 TA=125 °C, 1,000 hours, Rated power, 77pcs
Terminal Strength	+/- (0.25 % + 0.05ohm)	AEC-Q200 No.11 30pcs
Vibration	+/- (1.00 % + 0.05ohm)	AEC-Q200 No.14 10~2,000 Hz, 30pcs
Solder ability	≥ 95 %	JIS C 60068-2-20 4.2.1 Pb-free solder, 245+/- 5 °C 3 sec. 22pcs
Soldering Heat	+/- 0.1 %	JIS C 60068-2-20 5.2.1 Pb-free solder, 260+/- 5 °C 10sec. 44pcs

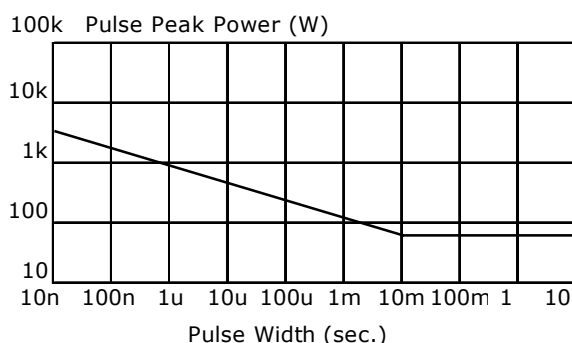
Derating



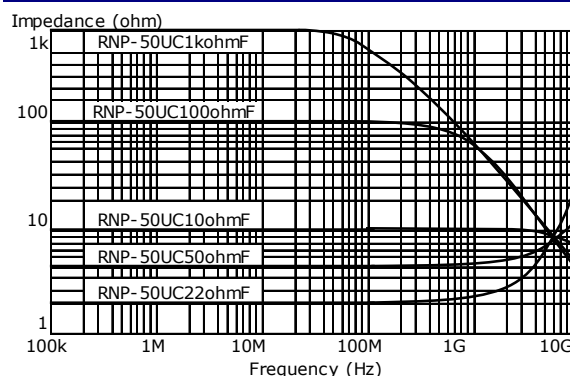
Temperature Rise



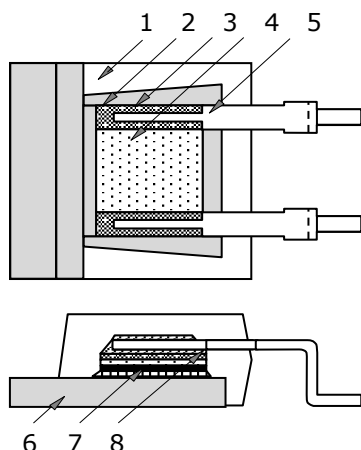
Pulse Energy Durability



Frequency Characteristics



Structure and Material

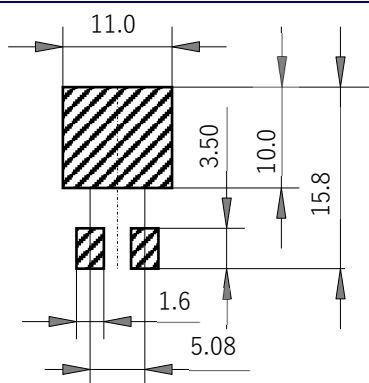


No.	Part	Material	Note
1	Exterior resin	Epoxy resin	UL94V-0
2	Substrate	Almina	-
3	Electrode	Thin-film: Cu Thick-film: Ag-Pd	- -
4-1	Resistive material	Thin-film: NiCr Thick-film: RuO	- -
4-2	Glass	Only in thick-film	
4-3	Internal protective layer	Epoxy resin	-
5	Terminal	Cu-Sn plating	-
6	Flange	Cu-Sn plating	-
7	Flange joint	Sn 97% Solder -Ag-Cu Pb 90% Solder -Sn-Ag	RNP-50E RNP-50F
8	Terminal joint	Pb 90% Solder -Sn-Ag	-

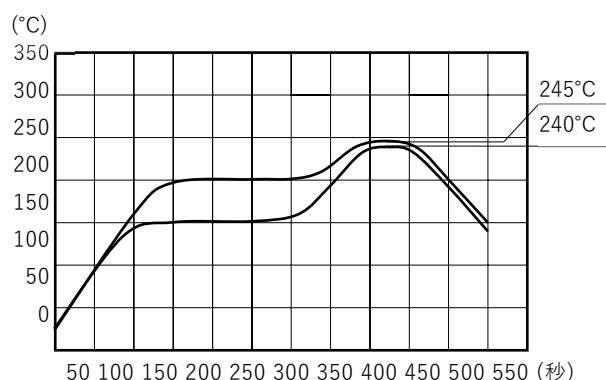
*Thin-film: 10-51kohm Thick-film: 0.01-1Mohm

*4: Layering in order as 4-1, 4-2.

Recommended Footprint



Reflow Profile



Note:

- (1) The resistance value and the tolerance are selectable not only from E24 as customization. Please contact to our factory for detail.
- (2) Flange is insulated from the internal resistive elements.
- (3) Resistance value is defined at the lead-crank section as the measurement point.
- (4) TCR value of low resistance values depend on the TCR of copper terminals. The TCR will shows the following values; 300ppm/0.02ohm、200ppm/0.05ohm、140ppm/0.1ohm、80ppm/0.2ohm
- (5) Tentative continuous-pulse power allowance at duty 0.01.

Instruction for Use

- (1) If the resistor is not mounted on a heatsink, please operate it at 2 W or less in ambient room temperature.
- (2) This product is not designed for use in the special environments listed below.
 - Direct sunlight, outdoor exposure, or dusty environments
 - Areas with corrosive gases such as sea breeze, Cl₂, NO₂, NH₃, H₂S, or SO₂
 - Environments with strong electrostatic discharge or electromagnetic interference
 - Installation in close proximity to heat-generating components
 - Mounting methods where the product is isolated from the heat-dissipation system and encapsulated or coated with resin
 - Environments with continuous condensation
- (3) Please handle the product with care, as it may be damaged if subjected to impacts such as dropping.
- (4) This product is not designed for radiation-resistant operation or for use in vacuum environments.

- (5) Please verify the product's performance and reliability when it is mounted in the actual equipment. In particular, when transient loads such as pulses are applied, be sure to confirm performance and reliability.
- (6) Any failure caused by operating the product beyond the conditions stated in the datasheet is excluded from our warranty.