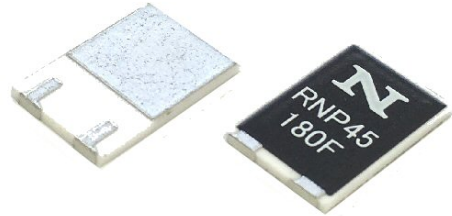


45W DPAK-TO252 STYLE
SMD SURGE PROTECTION RESISTOR

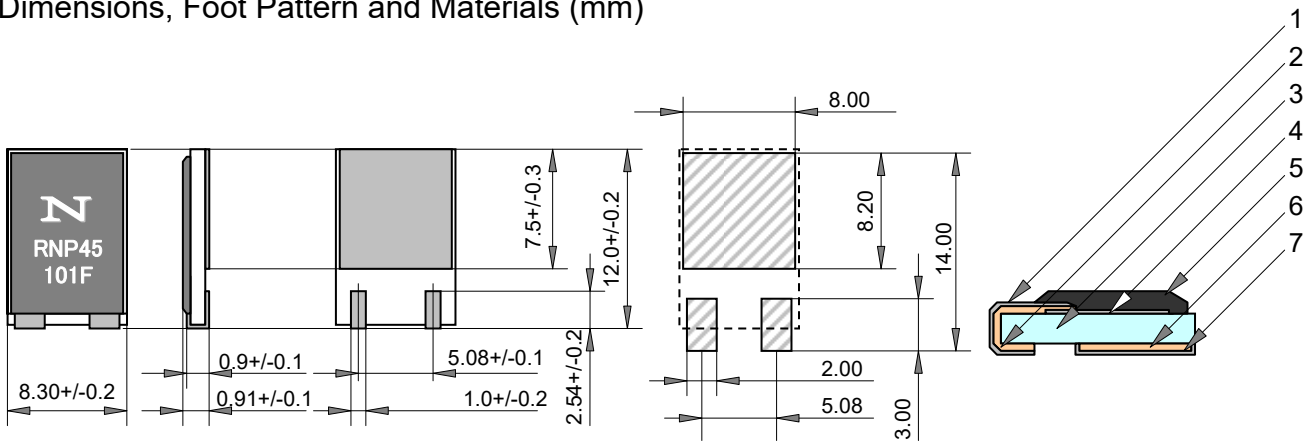
RNP-45



Features and Applications

- Very small size, low profile, right weight, TO252 style, SMD surge protection power film resistors.
- 55°C to +175°C temperature range provides for automotive applications.
- Low thermal resistance under 3.0 °C/W shows excellent cooling performance.
- Easy to replace TO252 D-PAK power resistor.
- Excellent rf characteristics advantage to high speed pulse operation.
- Applications include snubber, gate control, bleeder, filter, rush current protection, braking resistors of automotive, rail traction, wind turbine, PV, UPS and motor control inverters.

Dimensions, Foot Pattern and Materials (mm)



| | substance | material |
|---|-----------|--------------------------------------|
| 1 | terminals | Pd-Ag film, Ni plating & Tin plating |
| 2 | terminals | Copper, Ni plating & Tin plating |
| 3 | substrate | ALO 1mm thickness |
| 4 | resistor | Ni-Cr alloy |
| 5 | molding | Epoxy resin, UL-94 V-0 |
| 6 | heat sink | Pd-Ag film, Ni plating & Tin plating |
| 7 | heat sink | Pd-Ag film, Ni plating & Tin plating |

Ordering Information

| | | | | | |
|----------------|------------|----------------------------|-----------------|-------------|----------------|
| Type RNP-45 | blank - | Resistance 100 Ohm | Tolerance F* | Code Z01 | Remarks |
| RNP-45 | - | 0.02 Ohm- 510k Ohm E24+ | F(1%)* | Z01 | Tape & reel *1 |

*1-500pcs per reel, 254mm reel size

Recommend resistance 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 |

(*) Tolerance of 0.02ohm to 0.091ohm are +/-5% only.

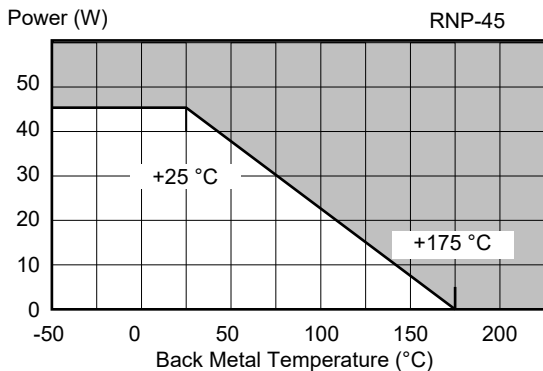
45W SMD POWER CHIP RESISTOR, RNP-45

Specifications

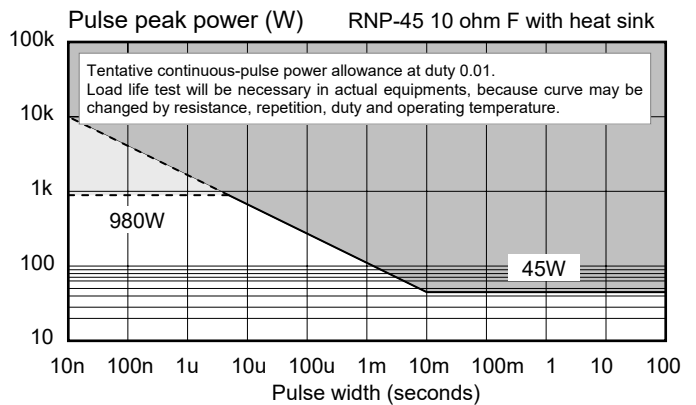
| | RNP-45 | Test Conditions |
|------------------------|--------------------------------------|---|
| Rating Power | 45 Watts | -55 °C to 25 °C backing metal temperature |
| Rating Power | 1.0 Watts | Attached on simple foot print, no heat sink. |
| Short Time Overload | 50W | Rated power X 2.0 and 5 second at 25°C with heat-sink |
| Heat Resistance | 3.0 °C/W | Resistor to back metal |
| Resistance Range | 0.02 Ohm – 510k Ohm | 0.02ohm-0.91ohm are available at 5% tolerance only. |
| Nominal | E24 + | Include 2.5, 4.0, 5.0, 8.0 and 16 |
| TCR | 100 ppm/°C | 10ohm to 51kohm, around 100 ppm /°C under 9.1ohm |
| Tolerance | +/-1% (F) | |
| Resistor Material | Thick Film | |
| Capacitance | 2.65 pF | Equivalent parallel capacitance, typical |
| Inductance | 14.65 nH | Equivalent series inductance, typical |
| Operation Temp. | -55 °C to +175 °C | |
| Max. Operating Current | 10A | |
| Max. Operating Volt. | less than 500V or $\sqrt{P \cdot R}$ | P is rating power and R resistance |
| Withstanding Volt. | 1500 VAC | Terminal and back metal, 60 seconds. 1mA |
| Load Life | +/- 1.0 % | 25 °C, 90 min. ON, 30 min. OFF, 1000h. |
| Humidity | +/- 1.0 % | 40 °C, 90-95%RH, DC 0.1W, 1000 hours. |
| Temp. Cycle | +/- 0.25 % | -55 °C, 30 min., +155 °C, 30 min., 5cycle |
| Soldering Heat | +/- 0.1 % | 350+/-5 °C, 3seconds, |
| Lead Solder ability | Over 95% of surface | 230+/-5 °C, 3seconds. |
| Insulation Resistance | Over 1,000 Meg ohm | Between terminals and back metal. |
| Vibration | +/- 0.25 % | IEC60068-2-6, see note |
| Weight | 0.324 gram | |

Note: 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

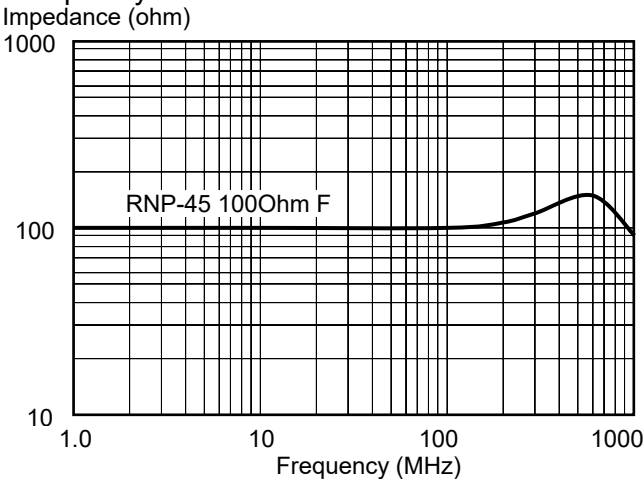
Power Derating



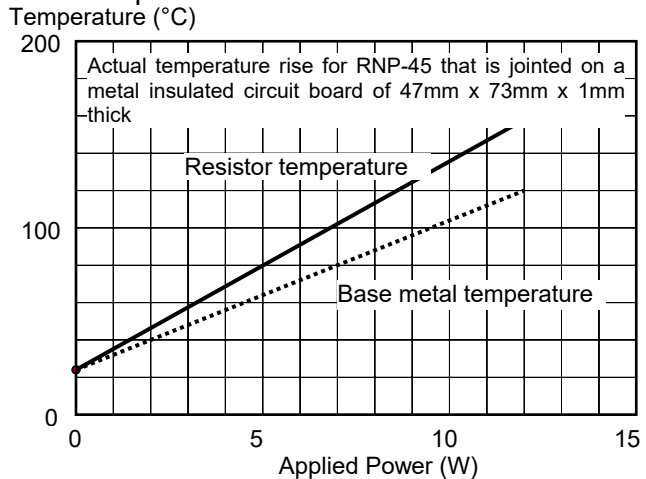
Pulse Energy Durability



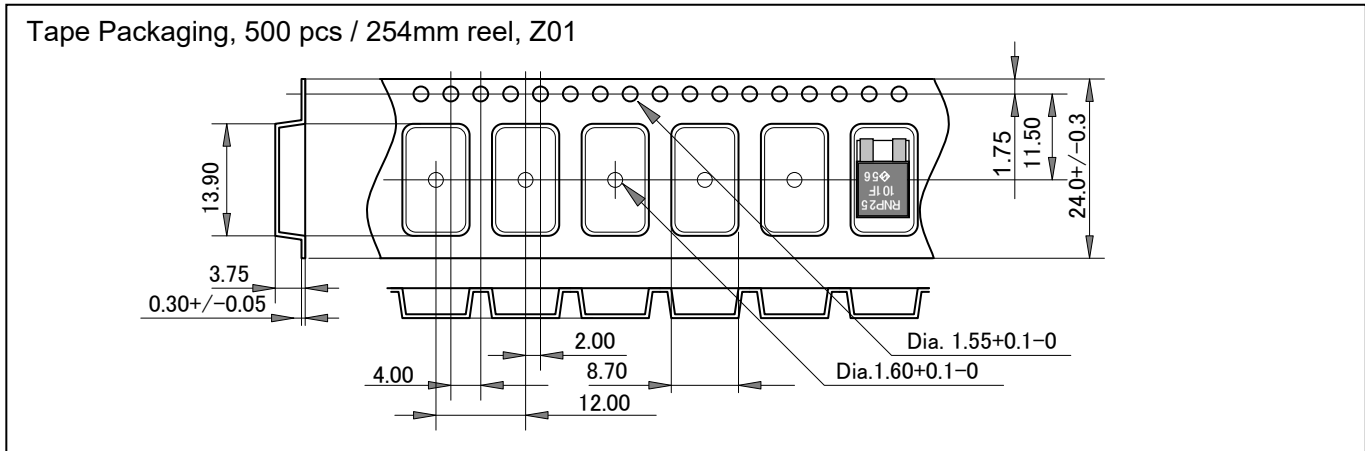
Frequency Characteristics



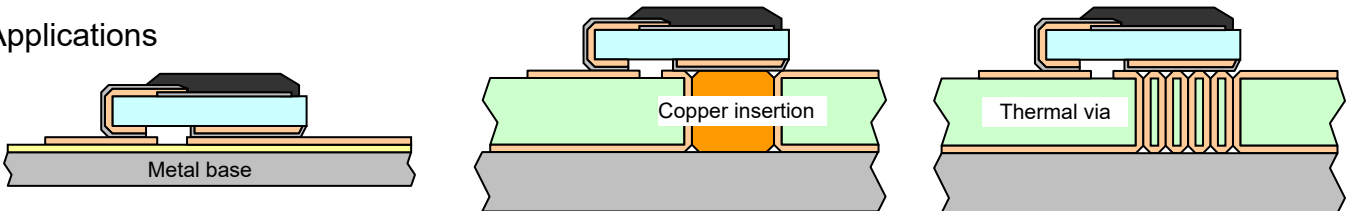
Temperature Rise



45W SMD POWER CHIP RESISTOR, RNP-45



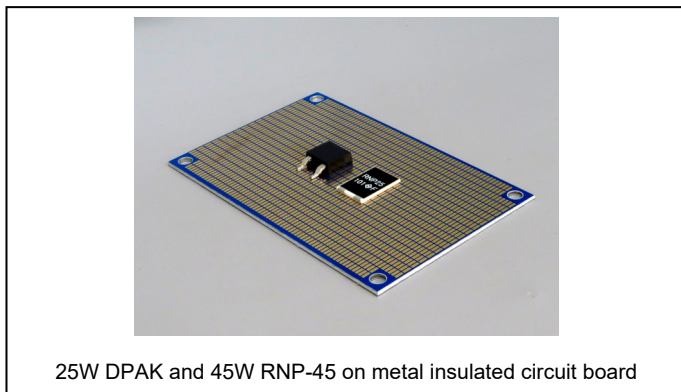
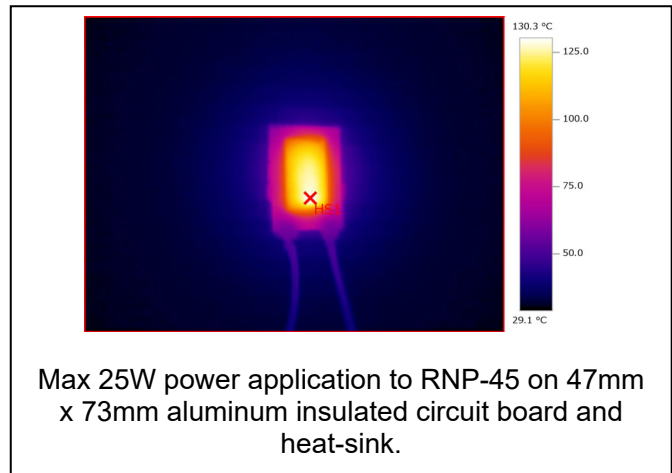
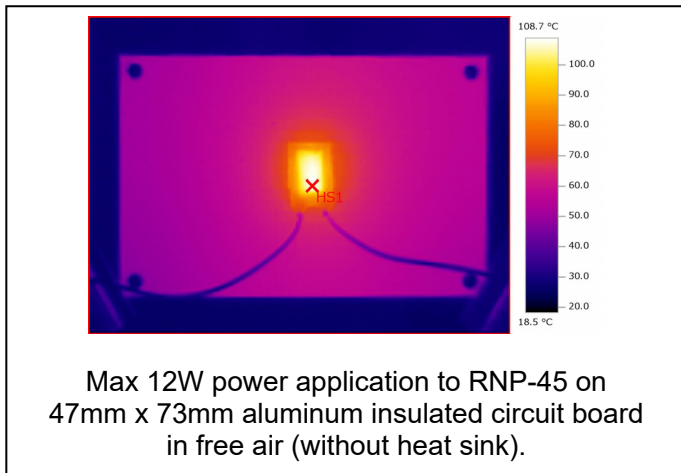
Applications



Metal insulated circuit board improves thermal absorption performance from resistor to heat-sink.

Copper insertion improves thermal absorption performance from resistor to heat-sink. Please note that the actual value of the thermal resistance from the bottom of the resistor through the circuit board to the heat-sink metal plate is smaller than our imagination.

Thermal via improves thermal absorption performance from resistor to heat-sink. Please note that the actual value of the thermal resistance through the circuit board to the heat-sink metal plate is smaller than our imagination.



For your reference
 Thermal resistance between resistor area to base metal of RNP-45 is 3.0 °C/W.
 Vertical thermal resistance of FR4 both side copper printed circuit board with 1.5 mm thickness and 1.0 inch square is approximately 10 °C/W.
 Thermal resistance of the single thermal via with dimension of 0.5mm diameter and 1.5mm length is around 100 °C/W, when 16 pieces of thermal via under base metal portion of resistor realize 6.25 °C/W.

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