



Flat Type Metal Clad Wire Wound Resistors

The IRN(N=Narrow and flat)&IRF(F=Flat) models are metal-clad, wirewound, high-power, low inductance resistors designed for industrial and other applications where space is at a premium and performance is a must. The ULN and ULF are UL approved versions of these models. All of these models use an extruded aluminum housing providing rugged and strong protection. The flat design allows excellent heat dissipation. These models are available with flying leads. The most common applications for these models are : Motor drives, braking and snubber applications and power sources for industrial equipment.



GENERAL SPECIFICATIONS

| Model | Rated Power (on Heat Sink) | Resistance Range | Resistance Tolerance |
|--------------------|-------------------------------|------------------|----------------------|
| IRN 50 / ULN 50C | 50W | 1Ω~420Ω | D [±0.5%] |
| IRN 100 / ULN 100C | 100W | 1Ω~1.1KΩ | |
| IRN 150 / ULN 150C | 150W | 1Ω~1.75KΩ | |
| IRF 100 / ULF 100C | 100W | 1Ω~1.1KΩ | |
| IRF 150 / ULF 150C | 150W | 1Ω~1.75KΩ | F [±1.0%] |
| IRF 200 / ULF 200C | 200W | 1Ω~2.2KΩ | G [±2.0%] |
| IRF 250 / ULF 250C | 250W | 1Ω~2.79KΩ | |
| IRF 300 / ULF 300C | 300W | 1Ω~3.5KΩ | J [±5.0%] |
| IRF 400 | 400W | 1Ω~4.45KΩ | K [±10.0%] |
| ULF 400C | | 1Ω~3.08KΩ | |
| IRF 500 | 500W | 1Ω~5.78KΩ | |
| ULF 500C | | 1Ω~2.46KΩ | |

*ULN = UL type of IRN / ULF = UL type of IRF

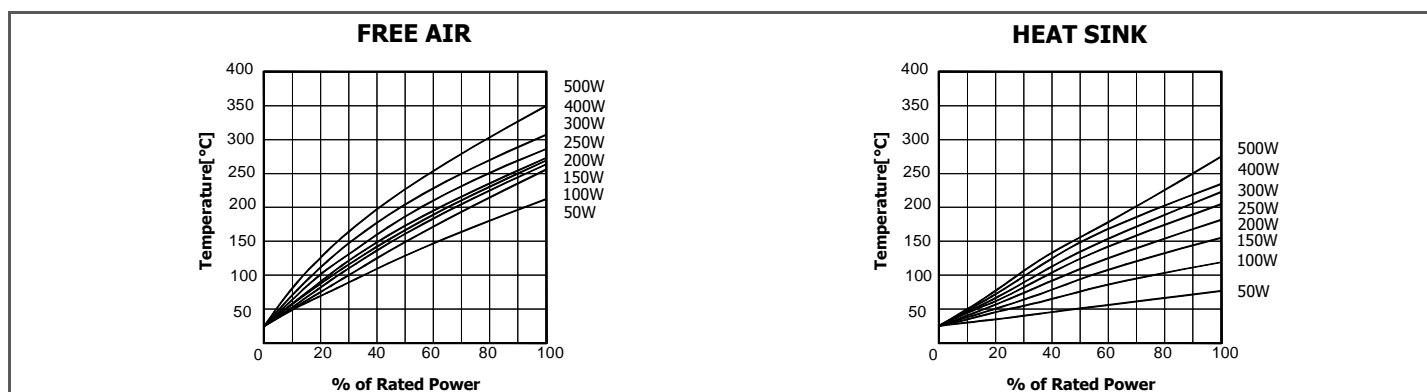
CHARACTERISTICS

Values in [] mean change in Ω after test

| | | |
|---------------------------------|--|--|
| Operating Temp. | Cement : -55°C~+200°C, Silicone : -55°C~+150°C | |
| Insulation Resistance | 20MΩ minimum | |
| Dielectric Withstanding Voltage | IRN / IRF | Available options : AC1500V,2500V,3500V,4500V for 1min. ; Max. leakage current : 2mA |
| | ULN / ULF | *See note 2200V for 1minute (Max input voltage Max 600V) |
| Temperature Coefficient | ±260ppm/°C maximum | |
| Short Time Overload | ±[1%+0.05Ω] | 5×Power rating 5seconds |
| Moisture Resistance | ±[2%+0.05Ω] | 40°C, 95% RH, DC100C case to terminal, 500hours |
| Thermal Shock | ±[1%+0.05Ω] | Power rating 30minutes, -25°C, 15minutes |
| Vibration | ±[1%+0.05Ω] | 10Hz-55Hz-10Hz (1minute), 2hours each direction |
| Moisture Load Life | ±[2%+0.05Ω] | 40°C, 95% RH, 0.1×Power rating 1.5hours on, 0.5hours off, 500hours |
| Load Life | ±[5%+0.05Ω] | Power rating 1.5hours on, 0.5hours off, 500hours |

*Note : ULN / ULF dielectric withstanding voltage options of AC 1500V, 3500V, 4500V are also available.
Optional dielectric withstanding voltage must be higher than standard (calculated by formula)

SURFACE TEMPERATURE INCREASE VERSUS POWER LOAD





DIMENSIONS [mm]

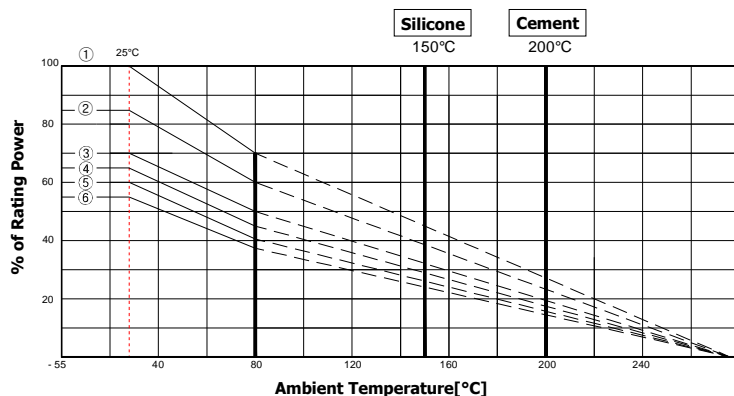
| Model | Dimensions [mm] | | | | Weight |
|--------------------|-----------------|--------|--------|--------|--------|
| | L1±1 | L2±0.5 | W1±0.5 | W2±0.5 | |
| IRN 50 / ULN 50C | 70 | 50 | 60 | 50 | 100g |
| IRN 100 / ULN 100C | 120 | 100 | 60 | 50 | 160g |
| IRN 150 / ULN 150C | 170 | 150 | 60 | 50 | 220g |
| IRF 100 / ULF 100C | 90 | 70 | 80 | 70 | 155g |
| IRF 150 / ULF 150C | 120 | 100 | 80 | 70 | 200g |
| IRF 200 / ULF 200C | 150 | 130 | 80 | 70 | 245g |
| IRF 250 / ULF 250C | 180 | 160 | 80 | 70 | 290g |
| IRF 300 / ULF 300C | 210 | 190 | 80 | 70 | 335g |
| IRF 400 / ULF 400C | 270 | 250 | 80 | 70 | 430g |
| IRF 500 / ULF 500C | 330 | 310 | 80 | 70 | 525g |

FLYING LEADS

| Model | 2mm ² | 1.25mm ² | UL3512 AWG16 |
|----------------|------------------|---------------------|--------------|
| IRN/F 50~150 | X | 1Ω ~ | X |
| IRF 200 | 1Ω ~ 4Ω | 4.1Ω ~ | X |
| IRF 250 | 1Ω ~ 5Ω | 5.1Ω ~ | X |
| IRF 300 | 1Ω ~ 6Ω | 6.1Ω ~ | X |
| IRF 400 | 1Ω ~ 8Ω | 8.1Ω ~ | X |
| IRF 500 | 1Ω ~ 10Ω | 10.1Ω ~ | X |
| ULN/F 50C~500C | X | X | 1Ω ~ |

* Option : Other options of flying leads are also available. Please ask RARA for more info. On this

DERATING CURVES



- ① IRN, IRF, ULN, ULF 100~500 on heat sink
IRN, ULN 50 in free air
- ② IRN, IRF, ULN, ULF 100 in free air
- ③ IRN, IRF, ULN, ULF 150 in free air
- ④ IRF, ULF 200 ~ 300 in free air
- ⑤ IRF, ULF 400 in free air
- ⑥ IRF, ULF 500 in free air

Heat sink size : IRN, IRF, ULN, ULF 100 : AL 200×200×3mm
IRF, ULF 200~400 : AL 400×400×3mm
IRF, ULF 500 : AL 600×600×3mm

This curve is for cement filled resistors only.
For silicone filled resistors, care must be taken to maintain the surface temperature below 150°C. In some applications, mounting on a heat sink is advisable.

ORDERING PROCEDURE EXAMPLE

| | IRF500 | C | 50 Ω | J | FL XXXX |
|-----|------------------|--|------------|--------------------|--------------------------------|
| | Model # | Filling Material (C=Cement) (S=Silicone) | Resistance | Tolerance | Flying Leads (mm) Option |
| Ex) | IRF100 ULF100 | [S] (Silicone) [C] (Cement) | 50Ω | F (±1%) J (±5%) | FL300mm |

Thermostat options are available for these models
: Internal and discreet connection.
Please ask RARA for more info on this.