Aluminium Housed Wirewound Power Resistor

Type HSF

Flat Heat Sink Resistor for mounting on a Heat Sink chassis.
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For compact construction:
Close mounting of heat sensitive components is possible due to only a slight rise of the temperature on the aluminium profile.

No heat sink compound is required because of large mounting surface.

Solder, Cable and “Fast-On” Termination

More resistors in one profile possible.

Specifications:

- Power rating: 12 W – 300 W
- Resistance range (standard)*: HSF 40: R1 – 3K3
  HSF 70: R22 – 6K8
  HSF 140: R47 – 18K
  HSF 210: R82 – 27K
  HSF 280: 1R – 39K
- Resistance tolerance: ± 5%/± 10%
- Dielectric strength: 2500 VAC peak
- Working voltage: 1200 VAC
- Test voltage: 6000 VDC

* Low-ohmic values on request # Type HSF

Designing

The following equations are applied by the dimensioning of the resistors at stationary load.

If more information is required please consult Danotherm.

It’s assumed that the air around the resistors is stationary. (Worst case).

Symbols employed:

- \( W_{\text{MAX}} \): Maximum required load in resistor
- \( T_{\text{MAX}} \): Maximum hot spot temperature requested in resistor
- \( T_{\text{AMB}} \): Ambient temperature
- \( R_{\text{TH1}} \): Heat sink resistance. Refer to table Thermal resistances
- \( T_{\text{H}} \): Heat sink temperature (chassis).
- \( T \): Temperature on top of the Aluminium profile.

Following conditions are possible:

1. \( R_{\text{TH1}} \) is mounted on a heat sink:
   - A. The thermal resistance \( R_{\text{TH1}} \) of the heat sink is known,
     \[ T = W_{\text{MAX}} x (R_{\text{TH1}} + R_{\text{TH2}}) \]
     Check that:
     \[ T_{\text{MAX}} = W_{\text{MAX}} x (R_{\text{TH1}} + R_{\text{TH2}}) + T_{\text{AMB}} <220^\circ C \]
   - B. The Temperature of the Heat Sink is known,
     \[ T = W_{\text{MAX}} x R_{\text{TH1}} + T_{\text{H}} \]
     Check that:
     \[ T_{\text{MAX}} = W_{\text{MAX}} x (R_{\text{TH1}} + R_{\text{TH2}}) + T_{\text{H}} <220^\circ C \]

2. \( R_{\text{TH1}} \) is mounted without a heat sink:
   - Check that:
     \[ T_{\text{MAX}} = W_{\text{MAX}} x (R_{\text{TH1}} + R_{\text{TH2}}) + T_{\text{AMB}} <220^\circ C \]

Thermal Resistances:

<table>
<thead>
<tr>
<th>HSF 40</th>
<th>HSF 70</th>
<th>HSF 140</th>
<th>HSF 210</th>
<th>HSF 280</th>
</tr>
</thead>
<tbody>
<tr>
<td>R_{\text{TH1}}</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>0.75</td>
</tr>
<tr>
<td>R_{\text{TH2}}</td>
<td>11</td>
<td>6.8</td>
<td>3.8</td>
<td>2.75</td>
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<tr>
<td>R_{\text{TH3}}</td>
<td>0.2</td>
<td>0.1</td>
<td>0.05</td>
<td>0.03</td>
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<tr>
<td>R_{\text{TH4}}</td>
<td>0.5</td>
<td>0.3</td>
<td>0.17</td>
<td>0.1</td>
</tr>
</tbody>
</table>

Mechanical specifications:

Please Order as follows:

<table>
<thead>
<tr>
<th>HSF</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>40</td>
<td>-</td>
</tr>
<tr>
<td>70</td>
<td>70</td>
<td>39.7</td>
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<tr>
<td>140</td>
<td>140</td>
<td>80</td>
</tr>
<tr>
<td>210</td>
<td>210</td>
<td>2x80</td>
</tr>
<tr>
<td>280</td>
<td>280</td>
<td>2x100</td>
</tr>
</tbody>
</table>

Ohmic values:

A: AMP terminals
L: Tinned lugs
S: Screw-on terminals
C: Cable (specified)

Size in mm.