Heatsink Sizing Guide

Use this quick guide to determine the approximate size of a heat sink to keep the resistor temperature within the required limits.

Given specifications of max. case temperature (Tc max) of the resistor, ambient air temperature (Ta), and power dissipation (Pd) of the resistor, determine the required thermal resistance (Rtheta) of the heat sink.

Rtheta = (Tc max – Ta) / Pd

With the Rtheta calculation above, go to the chart below to find the approximate heat sink volume needed for either a natural convection heat sink (no fan), a forced convection heat sink at air speed 500 or 1000 LFM (linear ft/min.) or a liquid cooled cold plate. (For this quick sizing guide we are ignoring the interface resistance from the resistor case to the heat sink. This can be a significant factor in the lower thermal resistances where cold plates operate.)

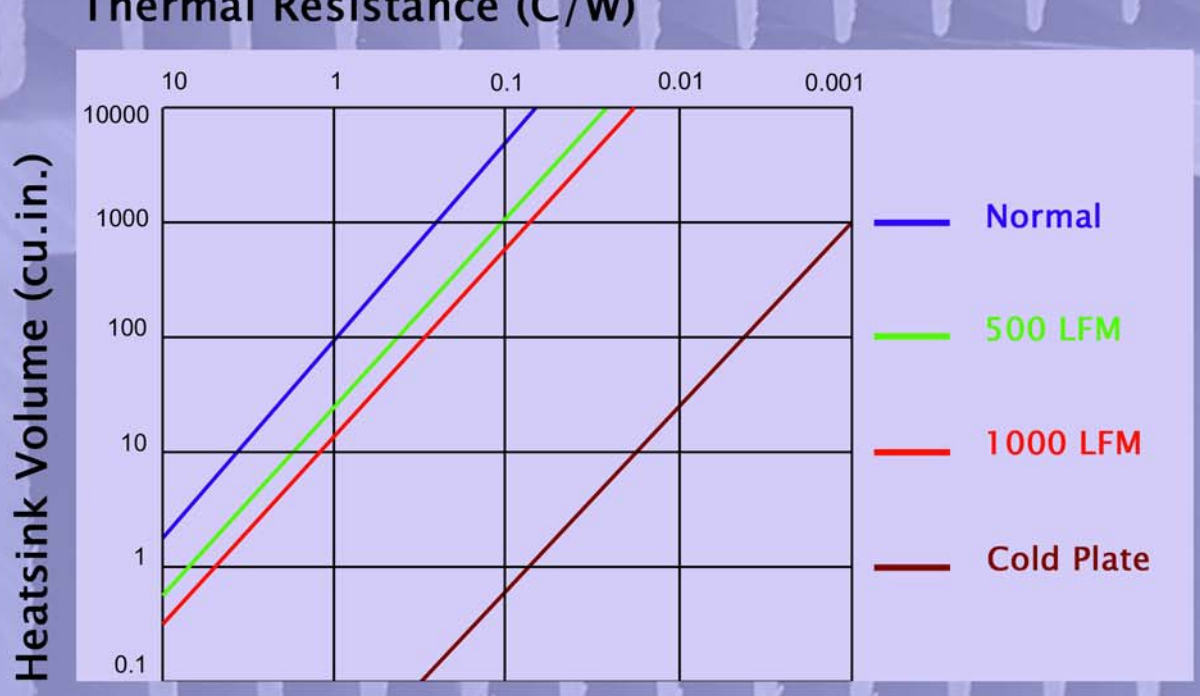
Example

1) If Tc max = 95C, Ta = 25C, and Pd = 100 W,
then Rtheta = (95-25) / 100 = 0.75 C/W

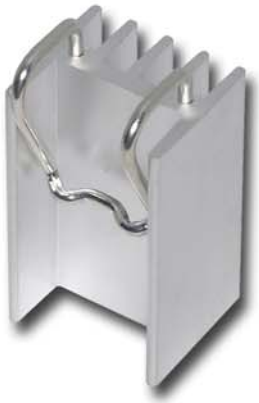
Using the chart below, the heat sink volume in natural convection (no fan) would be approximately 105 cubic inches. For 500 LFM, the size would be approximately 20 cu. in.

2) If a TAP 600 resistor is being used at 600W with a Ta of 25C (Tc max is 85C), then the Rtheta must be 0.10 C/W or lower. For 500 LFM airspeed the heat sink size would be approximately 900 to 1000 cu. in. Since this is such a large heat sink, much higher airspeeds should be considered to reduce the size or go to a liquid cooled cold plate.

The intent of this chart is to provide guidelines for heat sink size. For more accurate heat sink calculations contact the factory.



Thermal Resistance and Volume



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