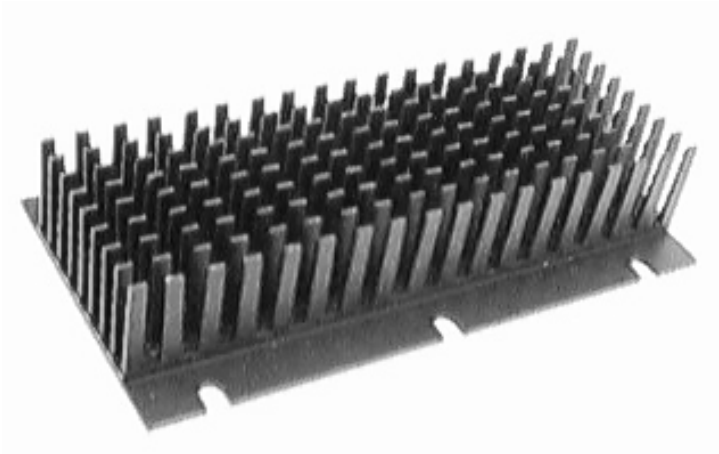
APC-ZHSF HEAT SINK
for Full Brick Converter Modules

Advanced Power Conversion PLC

Product Specification

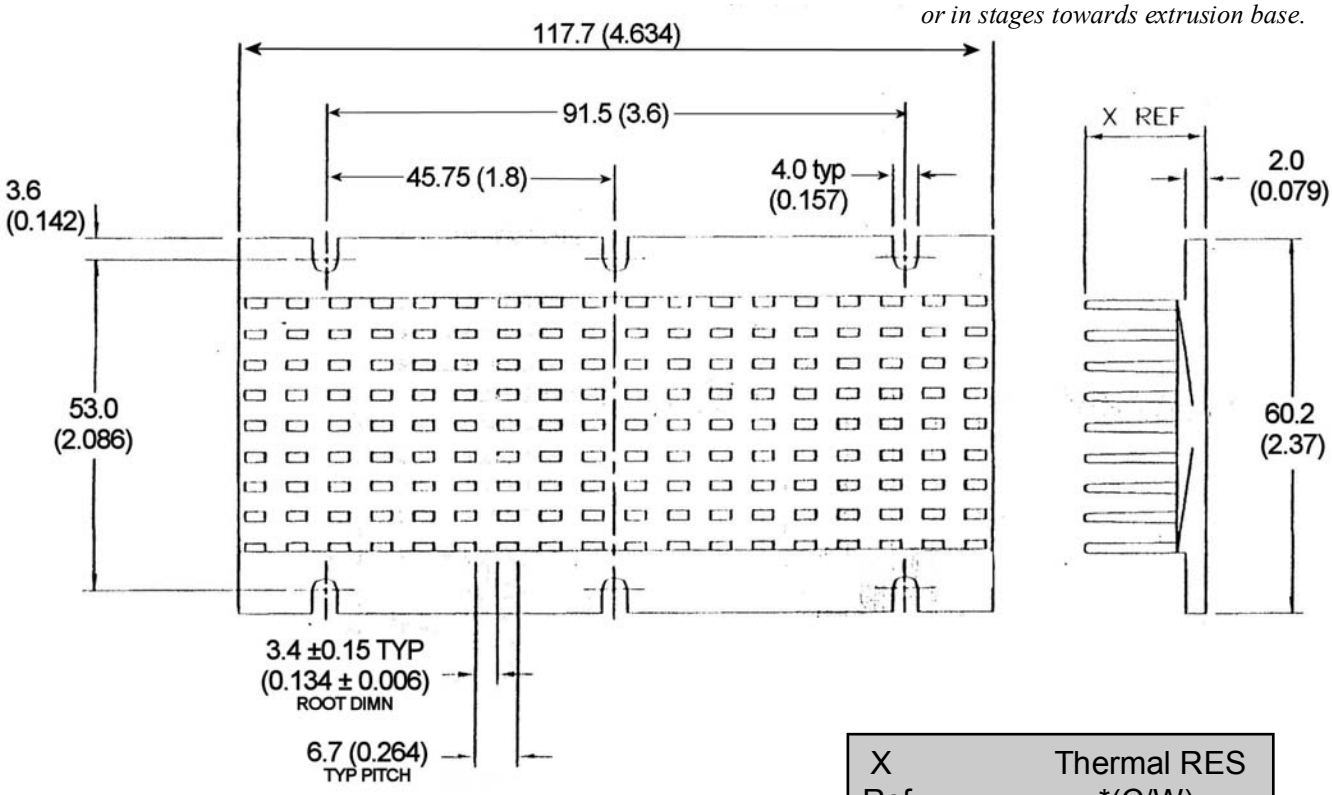


The APC-ZHSF is a cost effective and versatile way to provide simple and effective cooling for full brick DC-DC Converters & full brick PFC modules in your power system.

Using special fin design, the heatsinks are ideal for for both forced and natural convection.

The heatsink is available to suit the 500W, 200W and popular triple output module plus the APC-FP series of PFC modules and can be supplied complete with a fixing kit (APC-ZHSH-001) for ease of installation.

Fin gaps narrow either progressively or in stages towards extrusion base.



X Ref	Thermal RES *(C/W)
23.5 (0.925)	2.6#

All dimensions are in mm and ref only.
Dims shown in ( ) are imperial and also for reference only

Controlling dims in mm

Typical fin twist = 4‘ alternate
Except datum fin face

 # calculated data
** Horizontal - natural convection*

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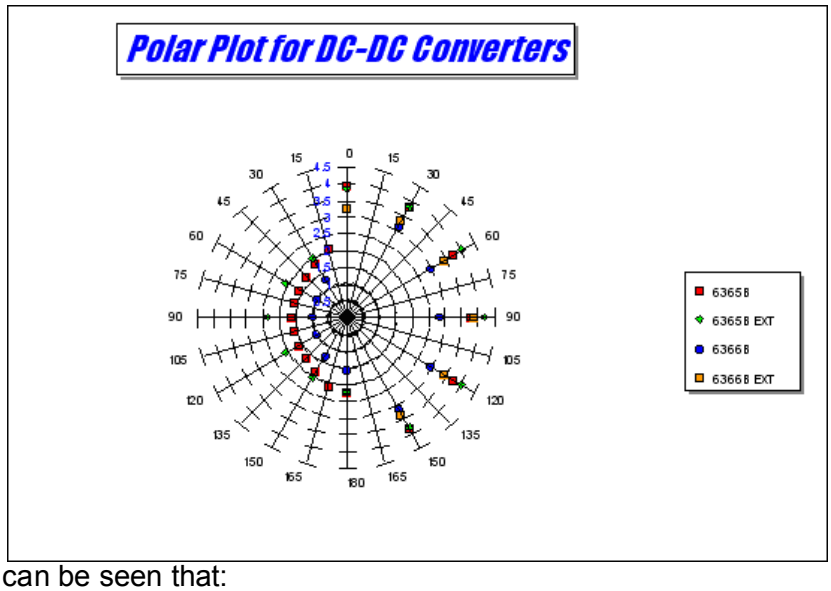
Illustrated below is a polar plot showing the data for the APC heatsink DC-DC converters against their relevant extrusions for both forced and natural convection.



From the graph, it can be seen that:
In free air conditions:

- Performance is within 5% when mounted in the vertical (Extruded) direction.
- The special fin design heat sinks perform 10% better when mounted vertically in the cross cut direction.
- The special fin design heat sinks have performance gains of typically 20% when mounted horizontally.

Under forced convection:
The special fin design heat sinks perform up to 30% better under forced convection of 1m/s.

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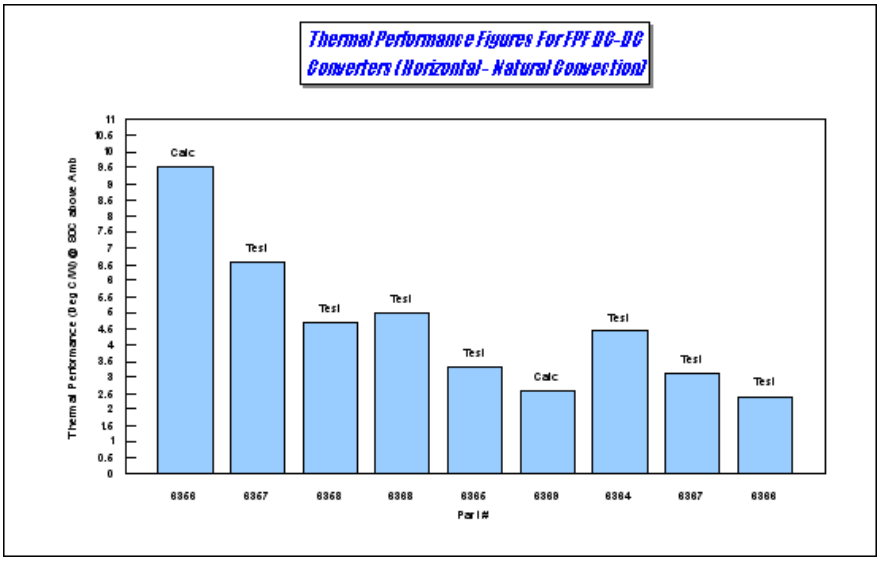
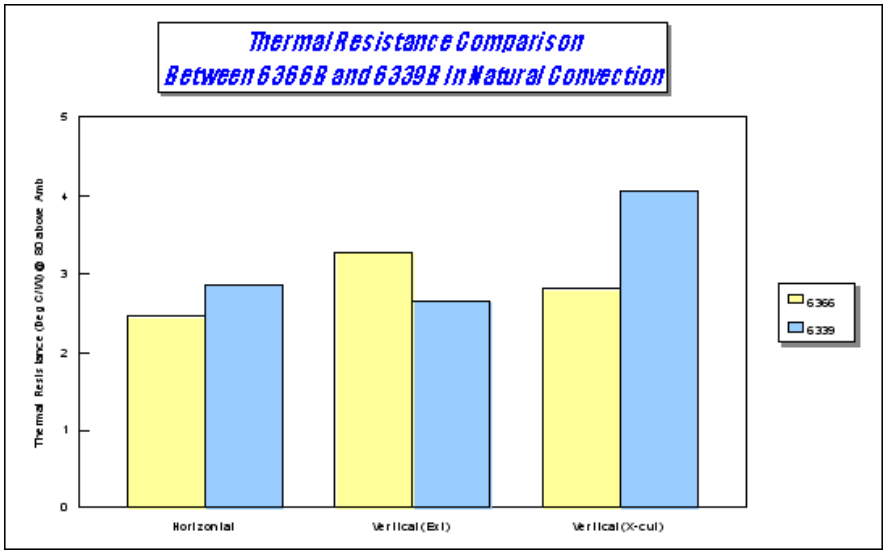
The graph below shows the thermal performance values of the DC-DC converter range in horizontal, natural convection conditions.



SPECIAL FIN DESIGN VS US PARTS

The graph below illustrates the performance differences in natural convection conditions between the 6366B and 6339B DC-DC converter heat sinks.



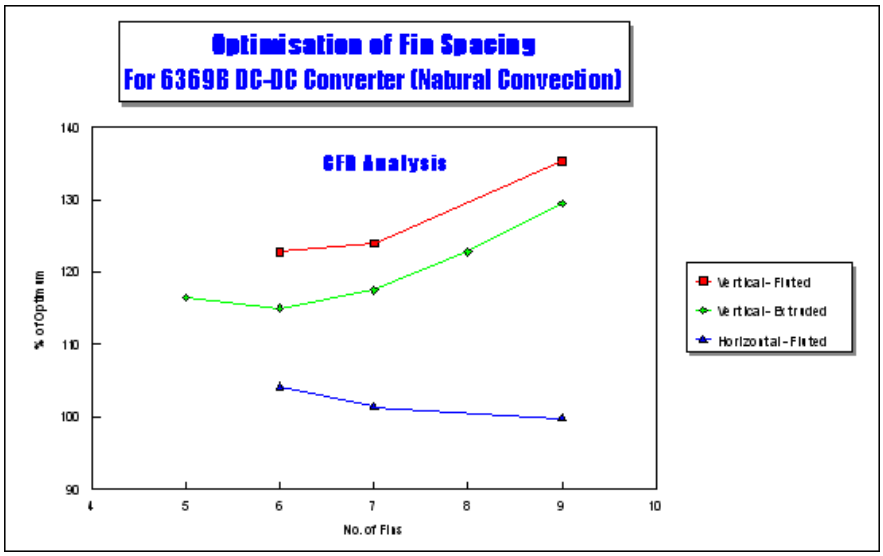
The graph shows:

- The performance gain of the 6339B over the 6366B in the vertical (Extruded) plane is almost 20%.
- In the vertical X-cut direction, a performance gain of 30% is achieved by the 6366B.

When mounted horizontally, an improvement of nearly 15% is achieved with the special fin design heat sink.

Fin Gap Optimisation

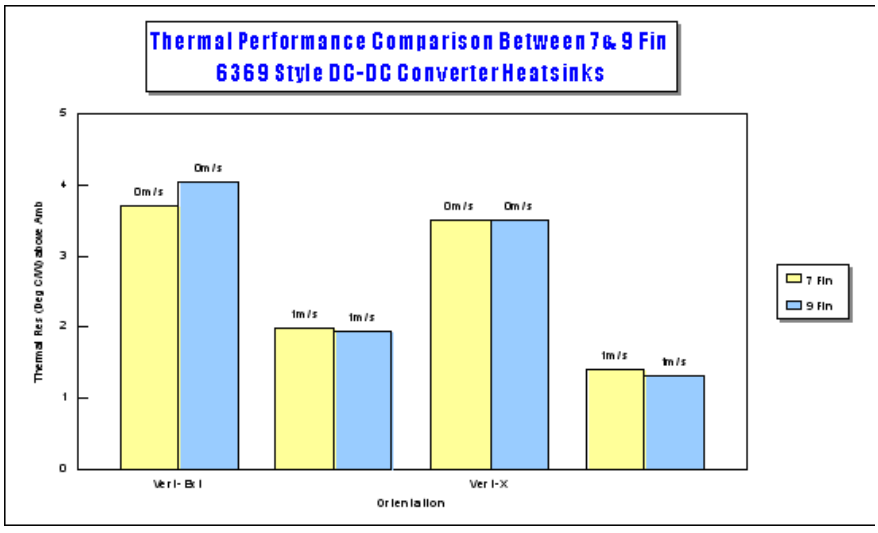
Below is a graph illustrating the performance changes of a leading brand style DC-DC converter with varying fin gaps from CFD analysis.



It shows:

- The current design of component 6369B is 15% worse in the vertical plane than if it were constructed from the optimum 7 fin width extrusion.
- The existing 9 fin width is 5% better in the horizontal plane than the 6 fin equivalent.
- The 9 fin width is optimised in the horizontal plane.

The graph below shows the comparative thermal performances (from CFD analysis) of both 7 and 9 fin width DC-DC converters.



From the graph:

In natural convection:

- The performance of the 7 fin width DC-DC converters in the vertical extruded plane is almost 10% better than that of the 9 fin.
- The performance difference is identical between the two in the vertical X-cut plane.

Under forced convection:

The 9 fin DC-DC converters out perform the 7 fin style consistently, although by less than 5%.

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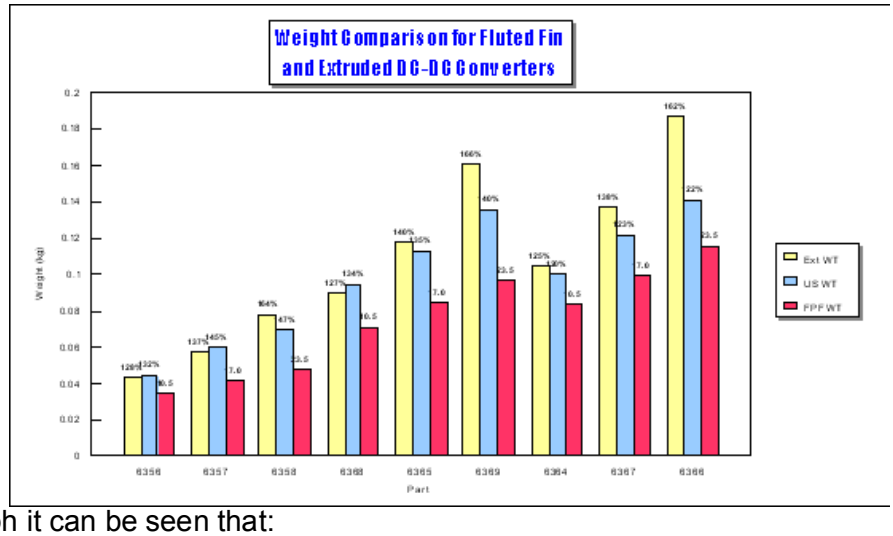
Weight Differences

Below is a graph showing the weight differences between the special fin design heat sinks, their extrusions and the equivalent US part.



From this graph it can be seen that:

Special Fin design to extrusion:

- For 10.5mm high components, special fin design parts are 20% lighter.
- For 17.0mm high components, special fin design parts are 30% lighter.
- For 23.5mm high components, special fin design parts are 40% lighter.

Special fin design to US parts:

- 10.5mm and 23.5mm high special fin design parts have a weight advantages of 25%-30% respectively for all Vicor style parts and 20% for long AT&T parts.

17.0mm high special fin design parts have a weight advantages of 30%, 25% and 20% for short Vicor style, long Vicor Style and long AT&T style respectively.

SUMMARY

Fluted to plain extrusion:

- Extrusion - 5% better in vertical orientation (natural convection).
- Extrusion - <5% better in vertical orientation (forced convection 1m/s).
- special fin design - 10% better in vertical x-cut orientation (natural convection).
- special fin design - 30% better in vertical x-cut orientation (forced convection 1m/s).
- special fin design - 20% better in horizontal orientation (natural convection).

6366B to 6339B

- 6339B - 20% better in vertical orientation (natural convection).
- special fin design - 30% better in vertical x-cut orientation (natural convection).
- special fin design - 15% better in horizontal orientation (natural convection).

Fin optimisation

- 7 fin - 15% better than 9 fin in vertical (Ext & x-cut) orientations (natural convection).
- 9 fin - 5% better than 7 fin in horizontal orientation (natural convection).
- 7 fin - 10% better than 9 fin in vertical orientation (natural convection).
- 9 fin - 5% better than 7 fin in vertical (Ext & x-cut) orientations (forced convection 1m/s).

Weight differences

- Special Fin Design components have weight advantages ranging from 20-30%.