

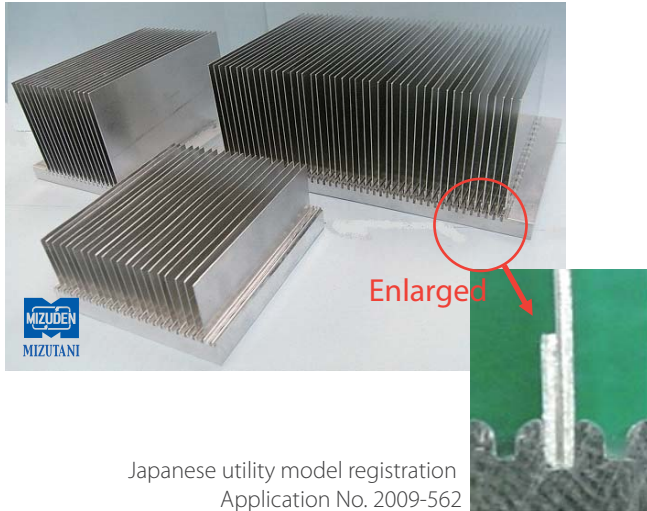
Development of J-Fin — Effectiveness of the J shape for heat sink design

Case Study for Mizutani Electric Ind. Co., Ltd.

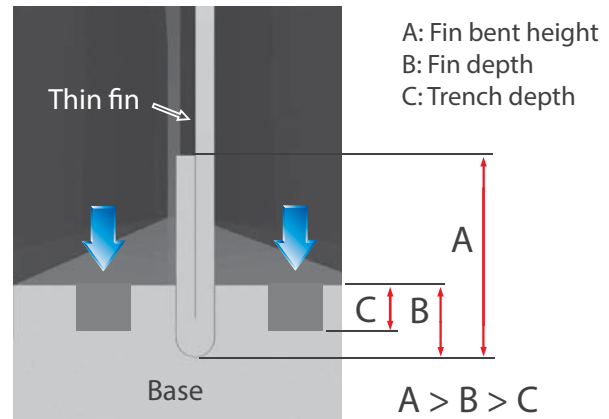
Application of HeatDesigner for designing a light weight, high performance heat sink

J-Fin JF Series

High performance ultra-thin heat sink



Characteristic of J-Fin (Conceptual Image)

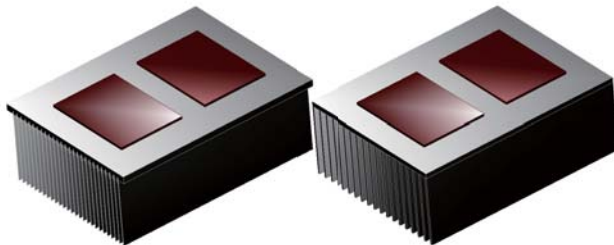


J-fin designed to better adhere to the base by making the bent height higher than the trench depth.

Fluid analysis evaluation

Proposed design (with J-fins)

Original design (extruded heat sink)

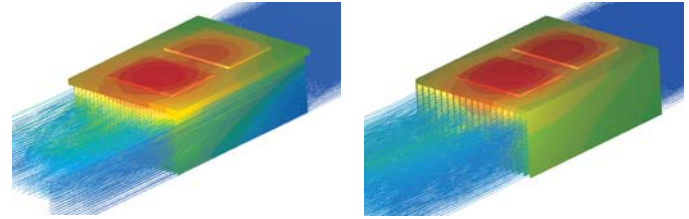


Sections	Proposed design	Original design
Width (mm)	189	189
Length (mm)	90	250
Height (mm)	250	90
Base thickness (mm)	8	6
Fin thickness (mm)	0.6	2
Number of fins	27	19

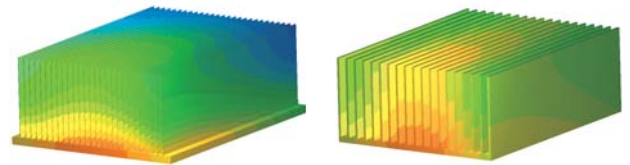
Analysis results

Proposed design (with J-fins)

Original design (extruded heat sink)



Streamline and temperature contour



Temperature contour

Performance	Proposed design	Original design
Thermal resistance (°C/W)	0.090	0.102
Pressure loss (Pa)	9.6	11.9
Mass (g)	2032	2918

Compared to the original design, J-fin
 - performs equally or better
 - achieves less pressure loss
 - reduces weight by 30% or more

Reliability test and thermal characteristics

● Test items and corresponding JIS*

Test items	JIS*
Vibration	JIS C 7021 A-10
Shock	JIS C 7021 A-7
Rapid change of temperature	JIS C 7021 A-3
Temperature cycle	JIS C 7021 A-4
Salt spray	JIS C 7021 A-12

● Approx. thermal resistance

*Japanese Industrial Standards

Customer Comments

When we were asked to perform an advanced design development in a short time, HeatDesigner helped reduce production prototype and tests. This substantially shortened development time. HeatDesigner is a highly effective software tool for product development.