

Enhanced natural convection in a channel between two vertical conducting plates with discrete strip heaters

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▣ Motivation:

Maximize the potential for cooling electronics with natural convection by optimizing the vertical and horizontal separation of heat sources

▣ Contributions/Important Results:

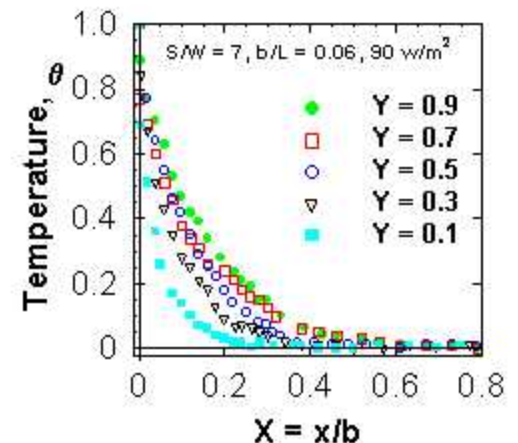
- Overall heat transfer is enhanced by 50% by the conducting parallel plate channel
- The effects of the narrow parallel plate channel are insignificant for separation ≥ 4 cm
- Flow inversion in the channel and boundary layer distortion between widely separated heaters increases the local heat transfer
- Correlation established for $10^6 < Ra_q < 2 \times 10^{11}$ and $10 < Nu_q < 200$

$$Nu_q = 0.26 Ra_q^{0.242}$$

▣ Applications:

Cooling telecommunications and electronic equipment

THERMAL BOUNDARY LAYER



CONVECTION ENHANCEMENT

