

EVALUATION OF USING FERROFLUID AS AN INTERFACE MATERIAL FOR A FIELD-REVERSIBLE THERMAL CONNECTOR

Ahmed Yousif

Dr. Gary Solbrekken, Thesis Supervisor

ABSTRACT

The electrical functionality of an avionics chassis is limited due to heat dissipation limits. The limits arise due to the fact that components in an avionic computer boxes are packed very compactly, with the components mounted onto plug-in cards, and the harsh environment experienced by the chassis limits how heat can be dissipated from the cards. Convective and radiative heat transfer to the ambient are generally not possible. Therefore it is necessary to have heat transferred from the components conducted to the edge of the plug-in cards. The heat then needs to conduct from the card edge to a cold block that not only holds the card in place, but also removes the generated heat by some heat transfer fluid that is circulated through the cold block. The interface between the plug-in card and the cold block typically has a high thermal resistance since it is necessary for the card to have the capability to be re-workable, meaning that the card can be removed and then returned to the chassis. Reducing the thermal resistance of the interface is the objective of the current study and the topic of this thesis.