Method for Qualitative Evaluation of COTS Board Reliability

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The diversity of Commercial Off The Shelf (COTS) electronics and the lack of data concerning their reliability is a concern for the reliability engineer. The proposed method allows a qualitative evaluation of the COTS reliability through a physical analysis of the components in laboratory and expert opinions.

The background of the method comes from the finding that the majority of the failures of electronics is due to lack of control in the industrial processes. The evaluation is therefore based on the analysis of the technological and industrial choices of the supplier as well as the manufacturing quality of the boards. Two similar COTS systems were analyzed to verify the underlying principle of the method, allowing for an unambiguous choice to be established.

Even if the method is mainly qualitative, it can also be used in order to improve the accuracy of predictive reliability calculations by allowing expert opinion to be converted into corrective factors. Finally, a link between this method and the definition of ∏part manufacturing and ∏process parameters from FIDES reliability handbook is proposed.