

Testing different electronic technologies with same test template

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Abstract

New automotive electronic components in the markets are validated applying accelerated tests and following the reliability specified by each automobile manufacture. Suppliers of automotive electronic components have problems to define the type and duration of the tests; the sequence of what tests are performed as well as the number of samples to make the tests representative. There are a lot of documents related with tests to validate products that sometimes are followed by the suppliers but the documents are not valid to the automobile manufactures because the documents might refer to different specifications not valid for the entire automobile manufactures. In order to have clear requirements big automobile companies have defined a specification where it is described the tests, durations, level of strength and number of samples to validate a product and, a flow chart as a template that includes all the requirements. The template described all the tests with number of cycles, sequence of the tests, number of samples and levels of strength. When an automotive product manufacturer is required to show evidence that the product is reliable must of the times the tests specified in the template are performed no matter the technology. On the other hand, sometimes suppliers have the template but, it is not easy to decide what kind of tests must be considered as part of the test plan. These situations address the next questions: Is it possible to have a template to test components with different technology? Can it be implemented a decision chart using the tests specified in the template?

This paper summarizes some of the current electronic technologies and understand the failure mechanism. Finally, it is concluded if the reliability of the different technologies can be proved using the same tests define in the template. The study covers Humidity, Mechanical and thermal fatigue with a 97% reliability and confidence of 50 which are the values required by automobile manufactures. It also explains the possibility to have a decision chart to help automotive electronic components suppliers to define the type of test needed to validate an electronic component.