

# Usage of COTS EEE Components in ASI Space Programs

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While the use of readily available commercial electronics, or so called “commercial off-the-shelf” (COTS) EEE components, are commonplace in military applications, the same is not the case for space applications. Though this appears to be changing, there is still a concern about COTS reliability in the space community.

The main reason for use of COTS EEE parts is because space applications are becoming more and more sophisticated and need “state of the art EEE Components” for their implementation, moreover classical Space components development plans and qualification schemes have already shown their limits for a long time.

As baseline the use of EEE components within the frame of Italian Space Agency institutional program is to adopt the ECSS applicable standards, properly tailored according to mission complexity and needs.

This approach has been applied not only in the context of large satellite projects but also for CubeSat such as ARGOMOON and LICIA CUBE that will fly on board of ARTEMIS and DART NASA missions, very demanding in terms of radiation hardness requirements.

In the last three years however, responding to the needs of the “New Space Economy” emerging market, ASI promoted an initiative to rethink how to select and control EEE COTS components to better match future mission profiles. This initiative has been launched in the frame of an ASI program called “EEE Surveillance” with the support of external advisors.

The question addressed under this initiative does not concern the opportunity to use commercial components in space applications but the need to define a PA/QA approach that allows to minimize the main risks associated with the use of COTS components and at the same time reduce costs of the traditional "up-screening" method proposed by the main applicable standards. Currently, this approach is applied only to PLATiNO program and the results are still under verification, it is based on:

- an appropriate selection of the component based on the data provided by the manufacturer;
- an evaluation phase of construction and radiation data;
- the definition of an appropriate test flow, with tests performed where possible at the board / unit level;
- the implementation of residual risk mitigation measures.

The intention is to extend this initiative to other Agency Small Sat missions in particular to those that have passed the selection of ASI call for tenders “Future missioni CubeSat” which are about to be started shortly.