

RADIATION TOLERANCE EVOLUTION OF CMOS INTEGRATED CIRCUITS - IAA-LA-06-01

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ABSTRACT

One of the main causes of environmental damage to the electronic components that have to operate in space missions has been historically the space radiation. This has determined the need to apply special conditions in the design, manufacture and qualification tests to them in order to guarantee that this factor will not produce the mission failure.

These special conditions of design, manufacturing and testing has given place to different categories of components (Rad Hard, Rad Tolerant) that guarantee different capabilities of survival in such environments.

Surprisingly, the technological evolution suffered by some components of mass market such as CMOS integrated circuits which not are designed, manufactured, or qualified for surviving in such environment has gone in the sense of making them more tolerant to radiation effects.

This paper shows the evolution in the tolerances of these integrated circuits for Total Ionization Dose (TID), and single events effects such as SEU, SEFI and SEL in different generations up to the present day and discussed its projection towards the future generations of electronic components of this type.