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RESEARCH ON SINGLE EVENT EFFECTS OF ETHERNET MAC CONTROLLER ON MANNED SPACECRAFT

Abstract

In order to realize higher speed and large flow network communication on the new manned spacecraft independently developed in China, it is necessary to apply Ethernet technology. However, the highest level of core control chips that can be purchased at present is industrial grade, so it is necessary to verify whether it can meet the special requirements of the space environment. According to the space environment of the manned spacecraft design orbit, and the sensitive characteristics of the Ethernet controller chip itself, it is necessary to focus on verifying its Single Event Effects. This paper introduces in detail the Single Event Effects of the Ethernet controller in China for the first time. The Bi-ion and Kr ions of the HIRFL cyclotron are used to carry out the Single Event Effects on the KSZ8851-16MLLJ Ethernet MAC controller produced by MICREL. The evaluation experiment, including the Single Event Effects test design, hardware platform, software functions and test data, finally gave the experiment conclusion.