THEORY OF OPERATION AND V_{DD} FAULT SCENARIO FOR LVDS PHYSICAL LAYER OF SPACEWIRE

Session: SpaceWire Components

Long Paper

Jennifer Larsen

Aeroflex Colorado Springs

4350 Centennial Blvd. Colorado Springs, CO 80907

E-mail: *Jennifer.Larsen@aeroflex.com*

The SpaceWire Standard ECSS-E-ST-50-12C calls for a Low Voltage Differential Signaling (LVDS) physical layer as defined in ANSI/TIA/EIA-644, Electrical Characteristics of Low Voltage Differential Signaling Interface Circuits. Recently there have been a number of papers published suggesting that Low Voltage Differential Signaling drivers do not contain current sources, and that there exists a realistic probability of catastrophic fault conditions occurring on the LVDS physical layer of SpaceWire.

Aeroflex LVDS drivers are compliant to the ANSI/TIA/EIA-644 standard and contain a current source that generates the required voltage across a 100Ω, parallel, resistor. This paper will describe the operation of Aeroflex LVDS drivers and receivers. And examine a hypothetical failure mode where the supply voltage, V_{DD}, exceeds the ABSOLUTE MAXIMUM RATINGS defined in the Aeroflex Datasheet and corresponding DSCC SMD and the laboratory results will be reported.