

SPACEWIRE BACKPLANE WITH HIGH SPEED SPACEFIBRE LINK

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Short Paper

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ABSTRACT

SpaceWire Backplane is backplane architecture with SpaceWire interconnect between each modules. In the backplane interconnection system, high speed signals are connected between daughter boards via connectors and a backplane. This reduces harness and improves signal integrity. Also, it is implemented the result that examined to aim for standardization of SpaceWire network topology.

In ISC2008, we proposed that the space qualified, non high speed backplane connector evaluated and has capability for high speed data transmission purpose if signal assignment carefully designed. Based on this result, we developed the SpaceWire backplane prototype with SpaceWire and SpaceFibre link. This backplane prototype includes a passive backplane board and daughter boards with following characteristics.

1. The backplane board is designed carefully that has capability to transmit data over 3Gbps SpaceFibre link.

2. The daughter board has both SpaceWire and SpaceFibre interface. The SpaceFibre interface supports 2.7Gbps transmission rate.

3. Backplane topology is defined as full mesh for SpaceWire and tree for SpaceFibre. One daughter board has seven(7) SpW channels and three(3) SpFi channels as controller.

In this paper we present: the design and implementation of the SpaceWire backplane, evaluation results of high speed signal quality of the backplane and daughter card prototyping result that includes SpaceFibre interface implemented by referencing latest specification to clarify ambiguities of specification.