Small Form Factor
Special Interest Group
www.sff-sig.org · info@sff-sig.org

What is SUMIT™?

Definition

SUMIT™ is an electromechanical connectorization specification that integrates common high-speed and low-speed serial and legacy expansion busses for next generation small embedded products. It is a stackable, I/O-centric expansion approach that is form-factor independent. The purpose is to provide a compact, stackable, multi-board solution for future embedded systems designs. The SUMIT™ acronym stands for Stackable Unified Module Interconnect Technology and is pronounced "Sum it".

SUMIT™ defines two high speed connectors and their respective signal assignments; however, it does not address the specific location (placement) requirements for the connectors on any specific form factor boards. Only the relative location (placement) of one connector to the other is specified to ensure proper routing of signals that are passed from one connector to another as they continue up in a stacked architecture.

In a single connector, SUMIT™ supports one x1 (pronounced "by one") PCI Express™ lane, three high-speed USB 2.0 interfaces, LPC (Low Pin Count) Bus, SPI/uWire, SMBus/I²C Bus, and ExpressCard™ signals on a single, tiny, high-speed connector. A second identical connector supports one additional x1 PCI Express lane, one x4 ("by four") PCI Express lane plus additional power, ground, and control signals. The second connector is for applications requiring more channels and higher bandwidth.

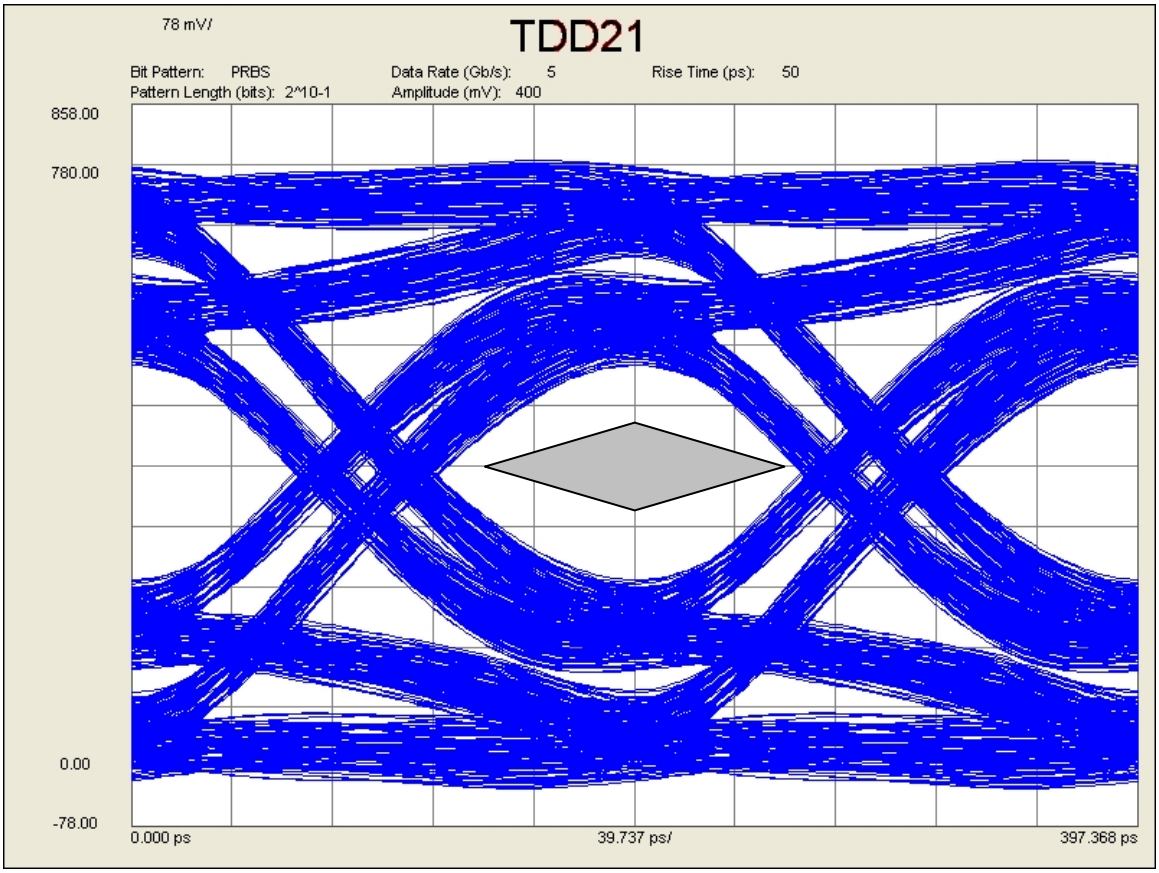
SUMIT can be used to support a single mezzanine card or to allow multiple boards on a stack. It is designed to be processor independent since it focuses on bus and interconnect technology rather than any single processor, DSP, or microcontroller architecture.

Connector Technology

As boards and systems get smaller and as the number of small form factors proliferates, it has become more important to focus on robust, high-speed connector technologies. The connector system must be able to handle high-frequency signals required by PCI Express and USB, and must be available off-the-shelf as a standard product. The connector must also have closely spaced pins (fine pitch) in order to minimize the board space consumed by the connector.

These requirements are met by the Samtec QFS/QMS Micro High Speed Connector Series with a 0.635 mm (0.0250-inch) pin pitch. It is a 1-bank terminal assembly that provides a ground blade in the center of the connector. The slightly larger QFS connector measures only 22.35 mm x 8.13 mm (0.880 x 0.320-inches) which means that it requires very little real estate on a board or module.

SUMIT™ can support Generation 2 PCI Express data rates of 5GT/s. These test results have been verified from Samtec's signal integrity division. The eye pattern of the signal (without compensation) is shown below.



Cost considerations

Cost is a key element in any design. SUMIT™ is defined in such a way so that only a single, one-bank connector can be used. This saves PCB board space plus the cost of an additional connector. By using two smaller, separate connectors instead of one large connector, an expansion or add-in board built with only a single connector can plug directly into other processor or expansion cards populated with both connectors, further reducing overall system cost. It is also possible for just the second connector to be used for applications only needing one PCIe x1 and/or one PCIe x4 lane.

Valid SUMIT™-compatible configurations are as follows: Type A that uses connector A only, Type AB that uses connectors A and B, and Type B that uses connector B only. The selection of which SUMIT connectors used is up to the discretion of the designer and their cost/performance goals.

For more information about SUMIT™ technology and its Specification, go to the Small Form Factors Special Interest Group web site located at www.sff-sig.org.