LSI53C120
SCSI HVD BUS EXPANDER

SINGLE-CHIP SCSI HVD BUS EXPANDER OVERVIEW

The LSI53CI20 is a single-chip solution allowing the extension of device connectivity and/or cable length limits of the SCSI bus. The LSI53C120 operates as a SCSI bus repeater when multiple single-ended to single-ended buses are connected together and as a converter when attaching a single-ended bus to a differential bus. In both modes, the device provides electrical isolation between the two separate SCSI buses. This product works with the extensive LSI53C7xx and LSI53C8xx family of SCSI products as well as other industry SCSI controllers. An advantage of the LSI53C120 is it does not require any software or consume a SCSI ID allowing for easy integration and maximum bus utilization. Adding the LSI53C120 to A SCSI bus environment creates a low risk solution for applications requiring scalable device connectivity and SCSI bus electrical isolation.

The LSI53C120 electrically isolates a SCSI bus into two distinctive segments. It supports both single-ended to single-ended, and single-ended to differential modes (using external differential transceivers). The A side needs to be connected directly to a single-ended SCSI bus. The B side has the single-ended capable transceivers as well as the individual driver controls for external differential transceivers.

The LSI53CI20 provides additional control capability through the pin level SCSI bus disable mode. This feature allows logical disconnection of both the A side bus and B side bus to without disrupting transfers currently in progress. For example, devices on the logically disconnected B side can be swapped out while the A side bus remains active.

BENEFITS

- Expands device connectivity and cable distances in certain applications
- Electrically isolates SCSI buses
- Allows for large disk configurations
- Does not consume a SCSI ID or limit system performance
- Completely transparent to the SCSI subsystem

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FEATURES

- Accepts any asynchronous or synchronous data transfer rates up to Ultra SCSI
- Targets and initiators can be located on either the SCSI A or B side
- Does not consume a SCSI ID
- Supports two modes of operation:
  - Repeater: Single-ended to Single-ended
  - Converter: Single-ended to Differential with external transceivers
- Connects two wide/narrow SCSI buses
  - Extends Ultra SCSI lengths in certain applications
  - Extends Total Ultra SCSI device support

As with all of the LSI Logic LSI53C7xx and LSI53C8xx SCSI products, the LSI53CI20 features TolerANT technology. The benefits of TolerANT include increased immunity to noise when the signal is going high, better performance due to balanced duty cycles, and improved SCSI transfer rates.

The following are examples of typical SCSI bus repeater and converter applications for the LSI53C120. Many other configurations are possible and are only limited by the imagination of the system architect.

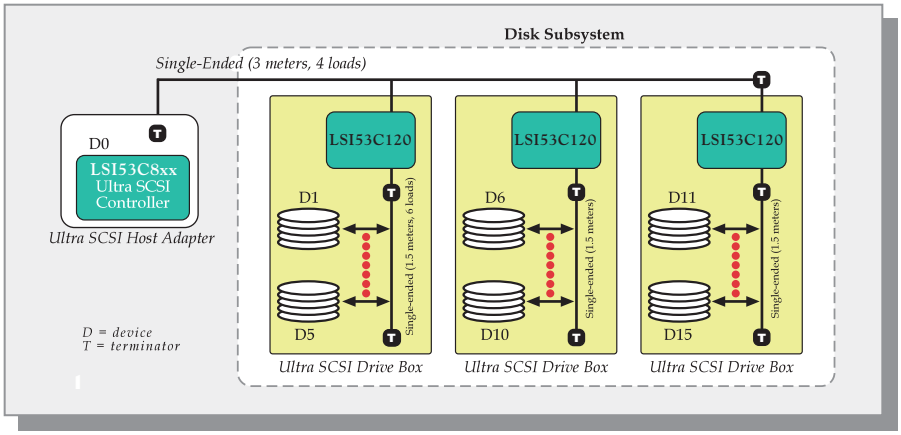

Figure 1: Scalable device connectivity

Figure 1 shows how the LSI53C120 could be used to repeat single-ended SCSI cable distances to maximize device connectivity. This configuration utilizes a 3 meter cable to support up to 16 devices on a single channel host controller.

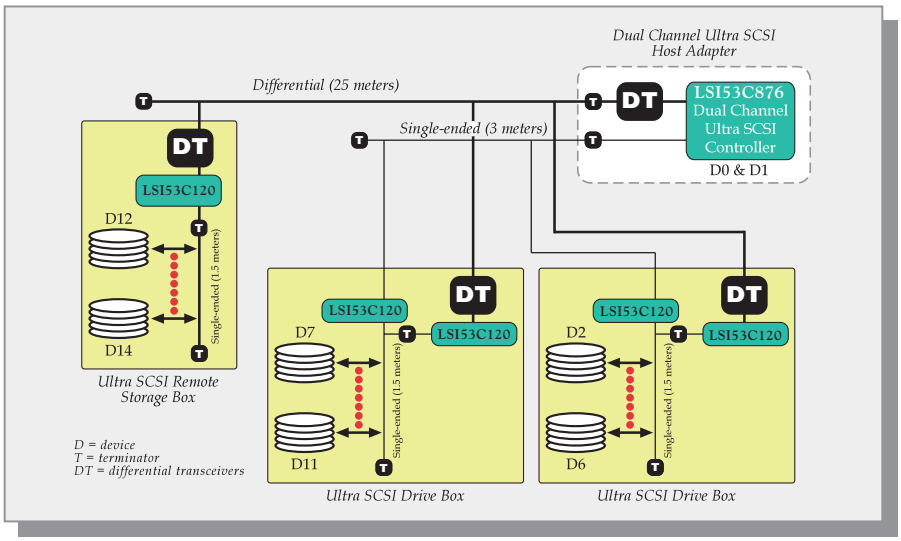

Figure 2: SCSI bus repeater and converter applications examples

Figure 2 employs both SCSI bus repeater and converter applications. This configuration demonstrates remote storage capability and SCSI bus channel redundancy.

The configuration in Figure 3 shows how the LSI53C120 could be used to electrically isolate the external SCSI bus from the internal bus. This configuration maintains the integrity of internal SCSI sub-system design yet allows new cables or devices to be added to the external bus. In other words, this application prevents end-user external configurations from affecting the operation of internal devices.

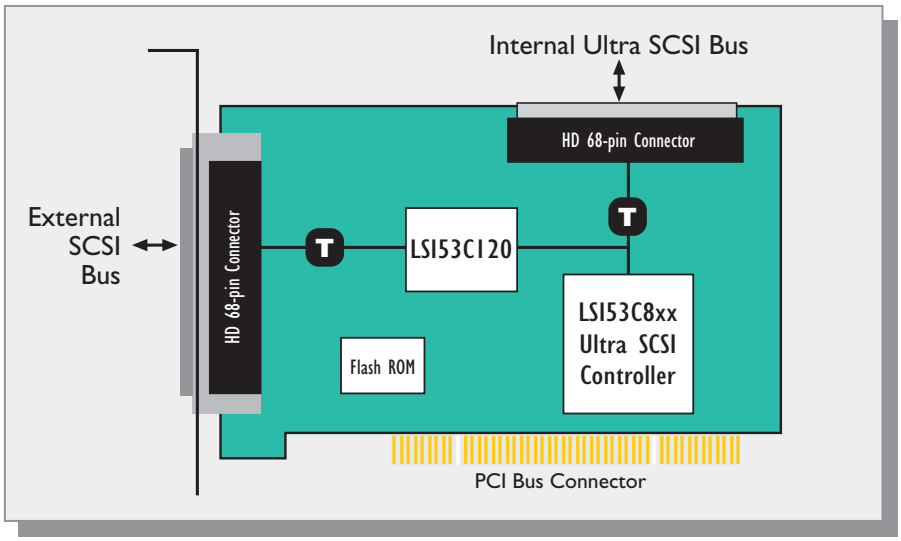

Figure 3: SCSI bus electrical isolation configuration

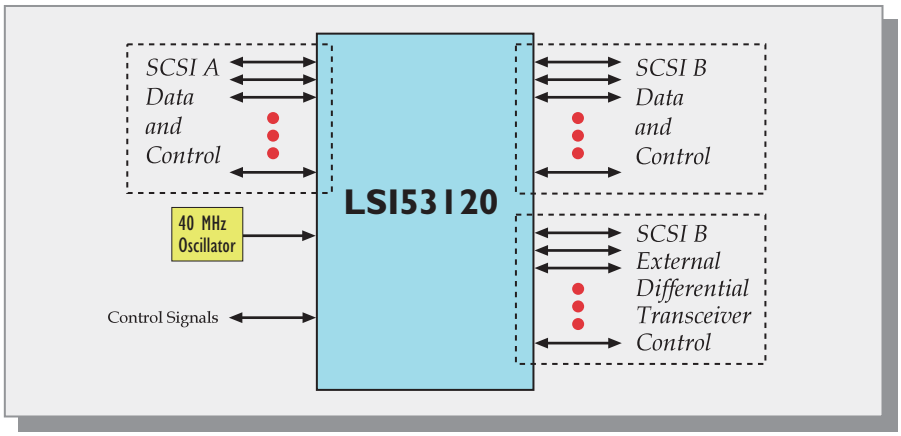

Figure 4: Functional signal grouping

FEATURES (Continued)

- Signals between buses are regenerated, reshaped, and transmitted transparently to the SCSI subsystem
- Supports TolerANT® active negation technology
- Complete support for SCSI -1, -2, and -3
- Completely independent of software
- Pin level SCSI bus disable mode
- Packaged in a 128-pin PQFP

For more information please visit the LSI Logic web site at:
http://storageio.lsilogic.com

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