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Information technology – Small computer system interface (SCSI) –

Part 112: Parallel Interface-2 (SPI-2)

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Contents

Tables

Figures

INFORMATION TECHNOLOGY – SMALL COMPUTER SYSTEM INTERFACE (SCSI) –

Part 112: Parallel Interface-2 (SPI-2)

FOREWORD

1) ISO (International Organization for Standardization) and IEC (International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.
2) In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.
3) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

International Standard ISO/IEC 14776-112 was prepared by subcommittee 25: Interconnection of information technology equipment, of ISO/IEC joint technical committee 1: Information technology.

ISO/IEC 14776-112 is intended to be used in conjunction with ISO/IEC 14776-311[1]. The resulting interface facilitates the interconnection of computers and intelligent peripherals and thus provides a common interface standard for both system integrators and suppliers of intelligent peripherals.

Annexes A, B, C and D form an integral part of this standard.

Annexes E, F, G, H, I, J, K, L and M are for information only.

[1] Under consideration.

Introduction

The SCSI protocol is designed to provide an efficient peer-to-peer I/O bus with the maximum number of hosts and peripherals determined by the bus width (typically 8 or 16 with 32 allowed). Data may be transferred asynchronously or synchronously at rates that depend primarily on device implementation and cable length.

SCSI is an I/O interface that may be operated over a wide range of media and transfer rates. The objectives of the parallel interface in SCSI are:

a) To provide host computers with device independence within a class of devices. Thus, different disk drives, tape drives, printers, optical media drives, and other devices may be added to the host computers without requiring modifications to generic system hardware. Vendor unique indications are accommodated. Reserved areas are provided for future standardization.
b) To provide interoperability with SCSI-2 devices. Devices meeting SCSI-2 and the SCSI Parallel Interface-2 standards co-exist on the same bus. SCSI-3 devices should be permissive of the SCSI-2 or SCSI-3 compliant behavior of other devices including those not implementing optional extensions of the SCSI Parallel Interface-2 Standard.

The interface protocol includes provision for the connection of multiple initiators (SCSI devices capable of initiating a task) and multiple targets (SCSI devices capable of responding to a request to perform a task). Distributed arbitration (i.e., bus-contention logic) is built into the architecture of parallel SCSI. A default priority system awards interface control to the highest priority SCSI device that is contending for use of the bus and an optional fairness algorithm is defined.

This international standard combines the functionality of the SCSI-3 Interlocked Protocol (SIP) standard, the SCSI-3 Parallel Interface (SPI) standard, and the SCSI-3 Fast-20 standard. This international standard is intended to be the choice for new designs over the above standards. In addition to combining the above standards several new features have been added into this international standard. Some of those features are; Low Voltage Differential (LVD), fast-40 data transfers, multimode signal-ended (MSE), and additional connectors.

The SCSI Parallel Interface-2 standard is divided into the following clauses:

- Clause 1 is the scope;
- Clause 2 enumerates the normative references that apply to this standard;
- Clause 3 describes the definitions, symbols, conventions and abbreviations used in this standard;
- Clause 4 describes the SCSI parallel interface model used in this standard;
- Clause 5 describes the connectors;
- Clause 6 describes the cable characteristics;
- Clause 7 describes the electrical characteristics;
- Clause 8 describes the SCSI bus signals;
- Clause 9 describes the bus timing;
- Clause 10 describes the removal and insertion of parallel SCSI devices;
- Clause 11 describes the SCSI parallel protocol characteristics;

Small Computer System Interface - Part 112: Parallel Interface-2 (SPI-2)

1 Scope

This international standard defines the mechanical, electrical, timing, and protocol requirements of the SCSI parallel interface to allow conforming devices to interoperate. The SCSI parallel interface is a local I/O bus that may be operated over a wide range of transfer rates. The objectives of the SCSI parallel interface are

a) To provide host computers with device independence within a class of devices. Thus, different disk drives, tape drives, printers, optical media drives, and other devices may be added to the host computers without requiring modifications to generic system hardware. Provision is made for the addition of special features and functions through the use of vendor-specific options. Reserved areas are provided for future standardization.
b) To provide compatibility such that properly conforming SCSI-2 devices may interoperate with SCSI-3 devices given that the systems engineering is correctly done. Properly conforming SCSI-2 devices should respond in an acceptable manner to reject SCSI-3 protocol extensions. SCSI-3 protocol extensions are designed to be permissive of such rejections and thus allow the SCSI-2 devices to continue operation without requiring the use of the extension.

The interface protocol includes provision for the connection of multiple initiators (SCSI devices capable of initiating an I/O process) and multiple targets (SCSI devices capable of responding to a request to perform an I/O process). Distributed arbitration (i.e., bus-contention logic) is built into the architecture of SCSI. A default priority system awards interface control to the highest priority SCSI device that is contending for use of the bus and an optional fairness algorithm is defined.

This standard defines the physical attributes of an input/output bus for interconnecting computers and peripheral devices.

Figure 1 is intended to show the general structure of SCSI standards. The figure is not intended to imply a relationship such as a hierarchy, protocol stack, or system architecture.

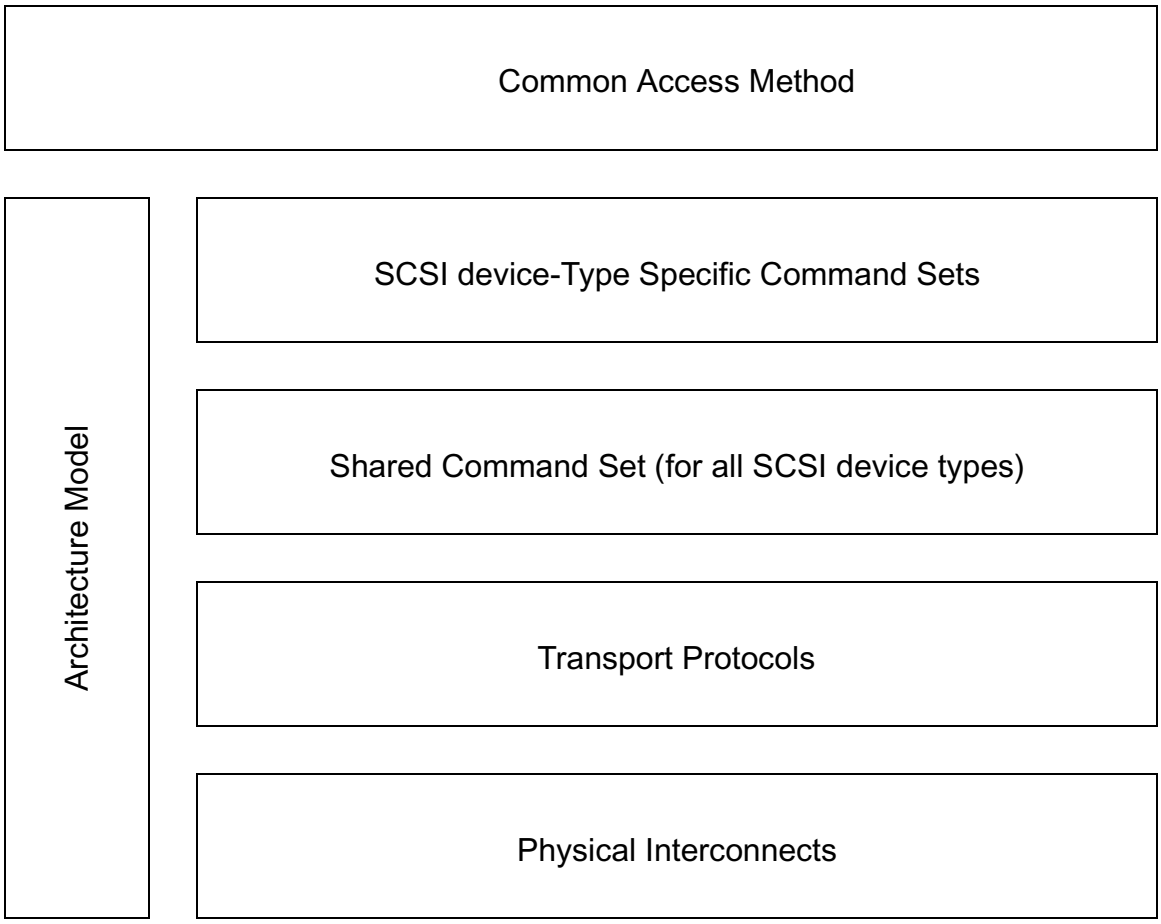

Figure 1 - General Structure of SCSI

This international standard is intended as an alternate to the SCSI-3 Parallel Interface Standard. This international standard, in addition to containing all the information in the SCSI-3 Parallel Interface Standard contains information and specifications for LVD and fast-40 along with many other improvements.

2 Normative references

2.1 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of ISO/IEC 14776. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO/IEC 14776 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of IEC and ISO maintain registers of currently valid International Standards.

2.2 Approved references

ISO/IEC 9316:1995, *Small Computer System Interface - 2*

ISO/IEC 8482:1993, *Information technology - Telecommunications and information exchange between*

systems - Twisted pair multipoint interconnections

ISO/IEC 14776-411,1999, *SCSI-3 Architecture Model standard*

IEC 60512-2:1985, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods - Part 2: General examination, electrical continuity and contact resistance tests, insulation tests and voltage stress tests*

IEC 60512-11-7:1996, *Electromechanical components for electronic equipment - Basic testing procedures and measuring methods - Part 11-7: Climatic tests - Test 11g: Flowing mixed gas corrosion test*

EIA-700A0AE (SP-3651), *Detail Specification for Trapezoidal Connectors with Non-removable Ribbon Contacts on 1,27 mm Pitch Double Row used with Single Connector Attachments (SCA-2)*

EIA-700A0AF (SP-3652), *Detail Specification for Trapezoidal Connector 0,8mm Pitch used with Very High Density Cable Interconnect (VHDCI)*

2.3 References under development

ISO/IEC 14776-412, *SCSI Architecture Model-2 standard*

ISO/IEC 14776-311, *SCSI-3 Primary Commands Standard*