Electronic Component Information Exchange (ECIX)

Pinnacles Component Information Standard (PCIS)

Version 1.4-1-123197

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Silicon Integration Initiative, Inc. is a not-for-profit corporation whose mission is to facilitate and promote the adoption of open EDA technologies which improve designer productivity.

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Foreword

The publication of the Si2 PCIS Version 1.4 marks yet another step in several years of invention, discussion, argument, and consensus, followed by further questions. This document is the product of the effort of many individuals and the contribution of many dollars and person-years of effort. To that end, every person who was involved at any point along the way should take pride in the existence of this Si2 standard.

The original development of the PCIS standard was accomplished under the coordination of the Pinnacles Group, with members from five electronic component manufacturers who joined together to create a technical information exchange standard for use by the electronics industry. These original member companies have all been active members of the Si2 electronic databook working group, and it was in conjunction with Si2 (then the CAD Framework Initiative, Inc.) activities that the original concept of the PCIS was developed. The original work of Hitachi America Limited, Intel, National Semiconductor, Philips Semiconductors, and Texas Instruments was extended when Hewlett-Packard and IBM Microelectronics joined the effort. Representatives of H-P, Hitachi, IBM, Intel, National, Philips, and TI currently serve as members of the Si2 ECIX Project Technical Advisory Board.

The earlier Pinnacles Group PCIS 1.2 became a part of CENELEC TC 217 WG 4. Future Si2 standards for ECIX PCIS will continue to be submitted to CENELEC, en route to target IEC standards.

The publication of the ECIX PCIS Version 1.4 represents another in a series of milestones in the maturation of the electronic computer-aided design industry. The Si2 membership and the industry have demonstrated again that there are areas of common agreement in the architecture, construction, and delivery of electronic product design systems information. This standard will be extended into additional areas with the ongoing development of ECIX PCIS. Each new release of this standard will continue the proven progress exemplified in the PCIS Versions 1.0, 1.1, 1.2, and 1.3.

Si2 invites interested parties to provide input into the development of ECIX through active participation in the various ECIX Working Groups, and in other Si2 projects where appropriate. For membership information, contact Si2 Member Services at http://www.si2.org.

Si2 continues as a leading contributor to standards for the EDA industry with actively participating companies and many individual contributors. They continue to work together to solve design system interoperability problems in areas where a common solution is recognized as being the most effective approach. Projects such as the ECIX Project are contributing important open standard solutions to key industry problems. As we move forward into new releases of this and other Si2 standards, the importance of the specifications will become registered in larger and larger circles within the industry.

Si2 and the ECIX team look forward to additional development and release of enhanced ECIX PCIS standards in the future.

PCIS Document Set Contents

General Introduction

PCIS Tutorial

Tag Library

SGML Declaration and DTDs

Sample Documents

General Introduction to PCIS

General Introduction to PCIS

Scope

The Pinnacles Component Information Standard (PCIS) models electronic component technical information and defines an interchange format which supports Electronic Data Books (EDBs) and the Electronic Component Information eXchange Standard (ECIX). The standard enables electronic component manufacturers to create and distribute EDBs, independent of the supplier's or customer's computing environment.

PCIS is an application of SGML (International Standards Organization (ISO) 8879) and has been submitted to standards organizations for accreditation as an international standard. It is interoperable with the ECIX system and its tools. PCIS is supported by both commercial and proprietary tools, and is an open, documented standard promulgated by the Silicon Integration Initiative (Si2) and by the IEC.

The domain of the standard is broadly defined as "electronic component technical information" and is more specifically that information traditionally printed as product specifications, such as datasheets, and supporting information, such as models and CAD tool metadata needed to support modeling of the component with design software.

This document includes a brief summary of the history of the PCIS development activity. A brief tutorial on the application is also available, as are documents describing the PCIS tags, Document Type Definitions (DTDs), and sample documents. Additional details about PCIS and how it is used within the ECIX environment is available in the Projects area of the Internet home page of Si2 at **www.si2.org/ecix**.

PCIS is designed to provide the most efficient transfer and re-use of component information possible, in both human- and computer-sensible form. The PCIS principles and methodology may be applied to any kind of electronic component, such as semiconductor devices, passive components, display components etc.

Structure of the PCIS Documentation

The PCIS documentation is organized into four parts:

- The PCIS Tutorial — describes the SGML architecture, intended use and application of the PCIS standard, and the rationale for the SGML design decisions;
- The PCIS Tag Library — provides definitions of the information elements that can occur within electronic component documents;
- The PCIS DTD Suite (the SGML declaration, Document Type Defintions, and specialty modules) — describes in SGML syntax the various classes of electronic components documents; and
- Sample tagged datasheets and datasheet fragments — provides reference documents.

Users of PCIS

PCIS can be used by many different types of users, with different benefits accruing to each type.

- Original Information Producers (OIPs) — companies who produce electronic components and materials and who supply information about those components to their customers.
- Value-Added Providers (VAPs) — companies who are in the business of adding value to a manufacturer's information (for example, models, simulations, etc.) and charging customers a fee for the value they add.
- Tool Suppliers — vendors of hardware/software tools, such as CAD/CAE systems, publishing systems, database management systems, etc., to the industry.

- Equipment Producers (EPs) — companies or end users who design electronic products which include the components supplied by OIPs.

Relationship to Existing Standards

PCIS has been built on existing standards activities, where appropriate, and was developed and placed in the public domain as an open standard.

The PCIS is an application of the meta-language of Standard Generalized Markup Language (ISO 8879:1986, also known as SGML). It is highly subject/content oriented, with a great deal of structure that can be used to describe the characteristics of electronic components. SGML is a technical standard, and it is not expected that all readers of this document will necessarily understand the minutiae of its use and syntax. More detailed information regarding SGML can be obtained from the texts and locations listed in “Informative References” on page 15.

Currently there are no analogous standards activities for the electronic component industry that match the PCIS in scope or applicability to the many phases of the business process and product life-cycle.

It is in no way the intention of the Pinnacles Group to duplicate existing standards, but rather to interoperate with related standards or standards activities such as:

- IEC SC3D; generating the IEC 1360 series of standards “Standards data element types with associated classification scheme for electric components”;
- JEDEC;
- ISO 10303 (STEP);
- ESPRIT Project 22124-CIREP “Component Information Representation European Project”.

The ECIX Project and the PCIS Working Group

In April 1993, after a year of preliminary work, Intel, National Semiconductor, Philips Semiconductors, and Texas Instruments formed the “Pinnacles Group” to produce a technical information interchange standard, PCIS. In July 1993, Hitachi America, Ltd. joined the Pinnacles Group. In 1995, Hewlett-Packard and IBM Microelectronics also joined. Throughout the process, support was provided from other semiconductor manufacturers, third-party information VARs, OEMs, and end-users. Other development projects such as CENELEC's CIREP (the original CFI’s Component Information Representation program) and the groups which eventually became the E-CALS project in Japan, were also contacted for exchange of information.

In 1994, after a year-long series of workshops and architectural development sessions, The Pinnacles Group and its contractors launched PCIS 1.0 for review by tool developers, independent consultants, and end-users. During the following year, further development of PCIS was limited to “bug fixes” and fine-tuning for better performance using existing commercial tools, resulting in the PCIS 1.1 release in September 1994. Soon after its inception in 1993, the European contribution to the development of PCIS became a part of CENELEC TC 217 WG 4, itself a part of the ESPRIT Project ESIP. In October of 1995, PCIS 1.2 was submitted to CENELEC as a Draft Working Standard for international certification.

In June of 1996, The Pinnacles Group member companies placed management and development of future versions of PCIS in the hands of the CAD Framework Initiative (now Si2) and the larger project of ECIX was formed to incorporate the PCIS as the core standard for interchange of electronic component technical information within that environment. The first deliverable of the ECIX project (and the PCIS Working Group, formerly the Pinnacles Group) was the PCIS 1.3 release, a maintenance and documentation upgrade based upon implementation experiences of project participants. This current release, PCIS 1.4, is being released as of December 31, 1997.

Additional Sources of Information about PCIS

Additional information about the PCIS is available on the world wide web at **www.si2.org/ecix**. This site is updated periodically to reflect the latest status of the PCIS and related standards. As part of the ECIX project at Si2, the PCIS is being made interoperable with other developing and existing standards. Information about these other projects is linked to the PCIS documents at that site.

The Electronic Design Automation (EDA) Standards Roadmap project and its working groups have established information repositories on the Si2 site. Tutorials, presentations, meeting announcements, membership information, and status notices about these and related projects can be accessed via the Si2 home page at **www.si2.org**.

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