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15 September 2006

Rohit Kapur
Synopsys Inc.
700 East Middlefield Road
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rkapur@synopsys.com

Re: P1149.4 - Standard for a Mixed-Signal Test Bus

Dear Rohit:

I am pleased to inform you that on 15 September 2006 the IEEE-SA Standards Board approved the above referenced project until 31 December 2010. A copy of the file can be found on our website at <http://standards.ieee.org/board/nes/projects/1149-4.pdf>.

Now that your project has been approved, please forward a roster of participants involved in the development of this project. This request is in accordance with the IEEE-SA Operations Manual, Clause 5.1.2i under Duties of the Sponsor which states:

"Submit annually to the IEEE Standards Department an electronic roster of individuals participating on standards projects"

For your convenience, an Excel spreadsheet for your use has been posted on our website at <http://standards.ieee.org/guides/par/roster.xls>. Please forward this list to me via e-mail at s.hampton@ieee.org no later than 14 December 2006.

Please visit our website, IEEE Standards Development Online (<http://standards.ieee.org/resources/development/index.html>), for tools, forms and training to assist you in the standards development process. Also, we strongly recommend that a copy of your draft be sent to this office for review prior to the final vote by the working group to allow for a quick review by editorial staff before sponsor balloting begins.

If you should have any further questions, please contact me at +1 732 562 6003 or by email at s.hampton@ieee.org.

Sincerely,

Sherry Hampton
Administrator, Governance
Standards Activities
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CC: bambang_suparjo@mentor.com

PAR Request Date: 01 August 2006**PAR Approval Date:** 15 September 2006**PAR Signature Page on File:** Yes**Type of PAR:** Revision to IEEE Standard**Status:** Revision to an Existing IEEE Std 1149.4-1999**Root Project:****1.1 Project No.:** **P1149.4****1.2 Type of Document:** Standard**1.3 Life Cycle:** Full-Use**1.4 Is this document in ballot now?** No**2.1 Title**

Standard for a Mixed-Signal Test Bus

Old Title

IEEE Standard for a Mixed-Signal Test Bus

2.1 Amendment/Corrigenda Title**3.1 Working Group Name**[Mixed-Signal Test Bus Working Group](#)**Working Group Chair**[Suparjo, Bambang](#)

Phone: 503-685-7084

Email: bambang_suparjo@mentor.com

Working Group Vice Chair[Ehrenberg, Heiko](#)

Phone: 512-502-3010

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3.2 Sponsor[IEEE Computer Society Test Technology \(C/TT\)](#)**Sponsor Chair**[Kapur, Rohit](#)

Phone: 650-584-1487

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Name of Standards Liaison Representative (if applicable)**3.3 Joint Sponsor****4.1 Type of Ballot:** Individual**4.2 Expected Date of Submission for Initial Sponsor Ballot:** January 2007**4.3 Projected Completion Date for Submittal to RevCom:** October 2007**5.1 Approximate number of people expected to work on this project:** 15

5.2 Scope: This standard defines a mixed-signal test bus architecture that provides the means of control and access to both analog and digital test signals such that the testability structure for digital circuits described in IEEE Std 1149.1-2001 has been extended effectively to provide similar facilities for mixed-signal circuits. In addition to testing of interconnections in the conventional sense of IEEE 1149.1-2001, the mixed-signal test bus defined by this standard also provides the means for parametric testing and, optionally, the means to access internal test structures. The standard does not mandate implementation details of the test circuitry, although examples of conformant implementations are given for illustration. Further, the standard develops extensions to Boundary-Scan Description Language (BSDL) as a means of describing key aspects of the implementation of this standard within a particular component. At present, the extensions to BSDL defined by this standard specifically omit the description of any and all analog parameters defined by the standard.

Old Scope: Interface system between mixed-signal electronic components, assemblies, and systems, and external or built-in-test equipment to provide those components, assemblies, and systems with testability attributes.

5.3 Is the completion of this document contingent upon the completion of another document? No

5.4 Purpose: Where structures defined by this standard are incorporated into mixed-signal circuits, the testability problems posed by such circuits are mitigated by way of improving the controllability and observability of mixed-signal designs and supporting mixed-signal built-in test structures in order to reduce both test development time and testing costs and to improve test quality. In particular, these standardized test features allow mixed-signal (analog and/or digital) electronic components, printed circuit assemblies, and electronic systems to be accessible to external or built-in test equipment for interconnect test, parametric test, and internal test. A further purpose of this standard is to define the descriptive elements of BSDL and specified extensions sufficient to support the development of automated test algorithms used for testing interconnections between devices that adhere to this standard and, where practical, between such devices intermixed with devices that incorporate IEEE Std 1149.1 or IEEE Std 1149.6 as well. The descriptive elements defined by this standard also largely support the automated construction of analog tests for external components attached to or between components that implement this standard with the caveat that such tests may subsequently require modification to account for undocumented analog features within the conformant components.

Old Purpose: To define and describe the signals, functions, and characteristics of the testability bus and to describe how the bus shall be implemented to improve the controllability and observability of mixed-signal designs and to support mixed-signal built-in test structures in order to reduce test development time, testing costs, and improve test quality.

5.5 Need for the Project: The reason for this project, as a revision to an existing approved standard, primarily is to support the development of software that can quickly create automatically generated tests to perform interconnection and parametric tests using the mixed-signal test bus architecture defined by this standard. A further need for other editorial changes and minor corrections has been identified over the course of use to date of the standard. A particular focus of such revisions will focus on harmonization with IEEE Std 1149.1-2001.

5.6 Stakeholders for the Standard: Stakeholders are individuals and organizations involved in design, manufacturing, and test of integrated circuits and higher-level electronic assemblies across a broad range of end-equipment segments, including, but not limited to, aerospace, automotive, computing, medical, and telecommunications, and their supply chains, including, but not limited to, electronic design automation and test equipment.

6.1.a. Has the IEEE-SA policy on intellectual property been presented to those responsible for preparing/submitted this PAR prior to the PAR submittal to the IEEE-SA Standards Board? Yes **Presented Date:** 2006-07-19

If no, please explain:

6.1.b. Is the Sponsor aware of any copyright permissions needed for this project? No

If yes, please explain:

6.1.c. Is the Sponsor aware of possible registration activity related to this project? No

If yes, please explain:

7.1 Are there other standards or projects with a similar scope? No

If yes, please explain:

Sponsor Organization:

Project/Standard Number:

Project/Standard Date: 0000-00-00

Project/Standard Title:

7.2 Is there potential for this standard (in part or in whole) to be adopted by another national, regional, or international organization? ? Do not know at this time

Technical Committee Name and Number:

Contact person:

Contact person Phone Number:

Contact person Email Address:

7.3 Will this project result in any health, safety, security, or environmental guidance that affects or applies to human health or safety? No

7.4 Additional Explanatory Notes:

8.1 Sponsor Information:

Is the Scope of this project within the approved scope/definition of the Sponsor's Charter? Yes

If no, please explain: