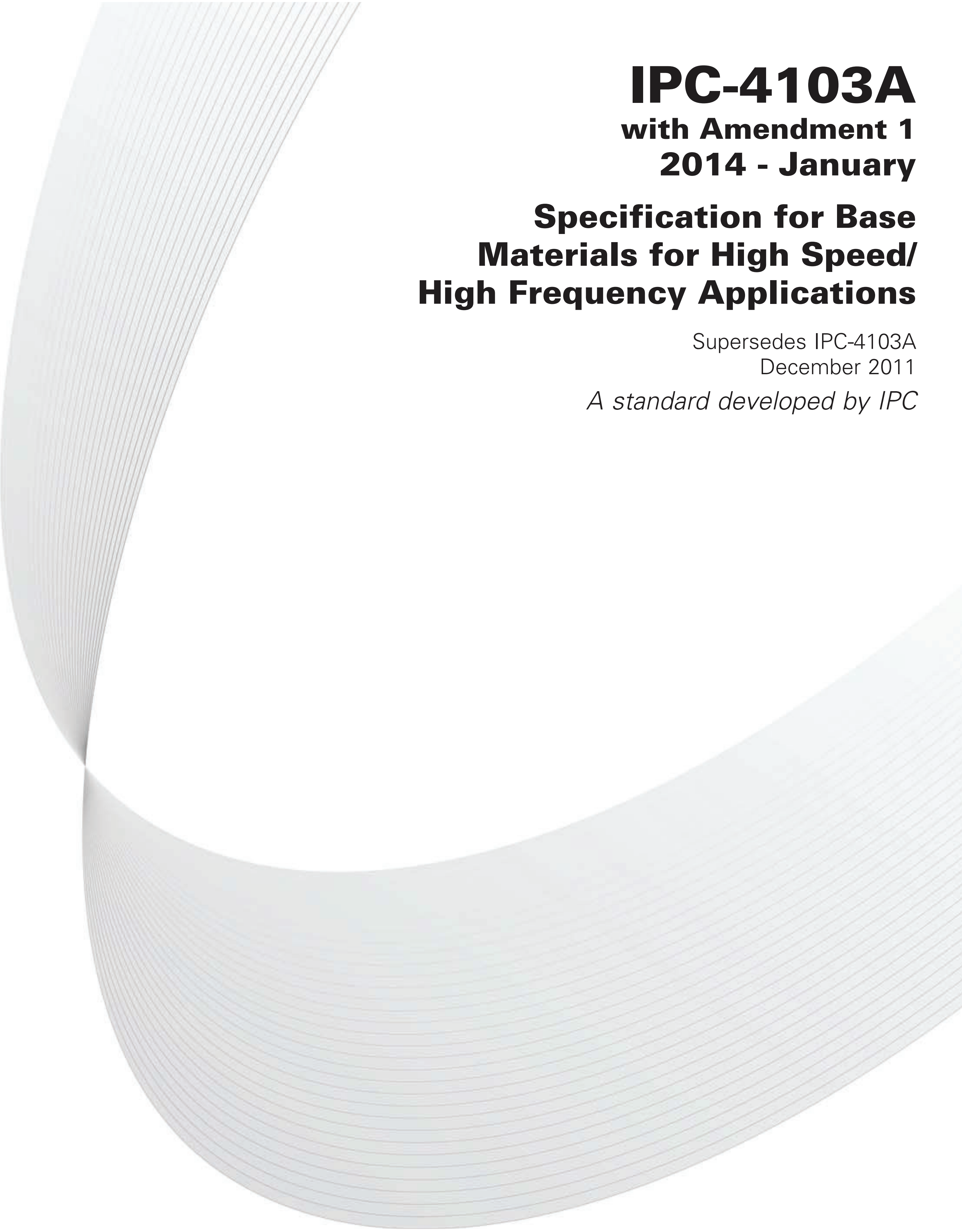

IPC-4103A

with Amendment 1
2014 - January

Specification for Base Materials for High Speed/ High Frequency Applications

Supersedes IPC-4103A
December 2011

A standard developed by IPC

Association Connecting Electronics Industries

IPC®

The Principles of Standardization

In May 1995 the IPC's Technical Activities Executive Committee (TAEC) adopted Principles of Standardization as a guiding principle of IPC's standardization efforts.

Standards Should:

- Show relationship to Design for Manufacturability (DFM) and Design for the Environment (DFE)
- Minimize time to market
- Contain simple (simplified) language
- Just include spec information
- Focus on end product performance
- Include a feedback system on use and problems for future improvement

Standards Should Not:

- Inhibit innovation
- Increase time-to-market
- Keep people out
- Increase cycle time
- Tell you how to make something
- Contain anything that cannot be defended with data

Notice

IPC Standards and Publications are designed to serve the public interest through eliminating misunderstandings between manufacturers and purchasers, facilitating interchangeability and improvement of products, and assisting the purchaser in selecting and obtaining with minimum delay the proper product for his particular need. Existence of such Standards and Publications shall not in any respect preclude any member or nonmember of IPC from manufacturing or selling products not conforming to such Standards and Publication, nor shall the existence of such Standards and Publications preclude their voluntary use by those other than IPC members, whether the standard is to be used either domestically or internationally.

Recommended Standards and Publications are adopted by IPC without regard to whether their adoption may involve patents on articles, materials, or processes. By such action, IPC does not assume any liability to any patent owner, nor do they assume any obligation whatever to parties adopting the Recommended Standard or Publication. Users are also wholly responsible for protecting themselves against all claims of liabilities for patent infringement.

IPC Position Statement on Specification Revision Change

It is the position of IPC's Technical Activities Executive Committee that the use and implementation of IPC publications is voluntary and is part of a relationship entered into by customer and supplier. When an IPC publication is updated and a new revision is published, it is the opinion of the TAEC that the use of the new revision as part of an existing relationship is not automatic unless required by the contract. The TAEC recommends the use of the latest revision. Adopted October 6, 1998

Why is there a charge for this document?

Your purchase of this document contributes to the ongoing development of new and updated industry standards and publications. Standards allow manufacturers, customers, and suppliers to understand one another better. Standards allow manufacturers greater efficiencies when they can set up their processes to meet industry standards, allowing them to offer their customers lower costs.

IPC spends hundreds of thousands of dollars annually to support IPC's volunteers in the standards and publications development process. There are many rounds of drafts sent out for review and the committees spend hundreds of hours in review and development. IPC's staff attends and participates in committee activities, typesets and circulates document drafts, and follows all necessary procedures to qualify for ANSI approval.

IPC's membership dues have been kept low to allow as many companies as possible to participate. Therefore, the standards and publications revenue is necessary to complement dues revenue. The price schedule offers a 50% discount to IPC members. If your company buys IPC standards and publications, why not take advantage of this and the many other benefits of IPC membership as well? For more information on membership in IPC, please visit www.ipc.org or call 847/597-2872.

Thank you for your continued support.

IPC-4103A with Amendment 1

Specification for Base Materials for High Speed/ High Frequency Applications

Developed by the High Speed/High Frequency Base Materials Subcommittee (D-23) of the High Speed/High Frequency Committee (D-20) of IPC

Supersedes:
IPC-4103A - December 2011
IPC-4103 - January 2002
IPC-L-125A - July 1992
IPC-L-125

This printing incorporates modifications to noted errata.

Users of this publication are encouraged to participate in the development of future revisions.

Contact:

IPC
3000 Lakeside Drive, Suite 309S
Bannockburn, Illinois
60015-1249
Tel 847 615.7100
Fax 847 615.7105

Acknowledgment

Any document involving a complex technology draws material from a vast number of sources. While the principal members of the High Speed/High Frequency Base Materials Subcommittee (D-23) of the High Speed/High Frequency Committee (D-20) are shown below, it is not possible to include all of those who assisted in the evolution of this specification. To each of them, the members of the IPC extend their gratitude.

High Speed/High Frequency Committee

Chair
Edward Sandor
Taconic Advanced Dielectric Division

Vice-Chair
Thomas N. Bresnan
R&D Circuits

High Speed/High Frequency Base Materials Subcommittee

Chair
Edward Sandor
Taconic Advanced Dielectric Division

Vice-Chair
Roy Keen
Rockwell Collins

Technical Liaison of the IPC Board of Directors

Bob Neves
Microtek Laboratories

High Speed/High Frequency Base Materials Subcommittee

James Baker-Jarvis, NIST
David Barrell, Isola Group
Silvio Bertling, Neltec, Inc.
Michael Brandon, Isola Group SARL
Thomas N. Bresnan, R & D Circuits
Christine Coapman, Delphi Electronics and Safety
John Coonrod, Rogers Corporation
David J. Corbett, Defense Supply Center Columbus
Joseph Davis, Rogers Corporation
Patricia S. Dupuis, Raytheon Company
Theodore Edwards, Dynaco Corp.
Mahendra S. Gandhi, Northrop Grumman Aerospace Systems
Patricia J. Goldman, P. J. Goldman Consulting
Jason Gretton, Panasonic Electric Works
Philip Henault, Raytheon Company
Todd Henninger, DDi Corp.
Michael D. Janezic, NIST
Thomas McCarthy, Taconic Advanced Dielectric Division
Julio Mendoza, Isola Group SARL
Thomas Dale Murry, Rockwell Collins
Christopher G. Olson, Rockwell Collins
Rolland D. Savage, High Performance Copper Foil Inc.
Joseph Schmidt, Raytheon Missile Systems
Antonio R. Senese, Panasonic Electric Works
Lowell Sherman, Defense Supply Center Columbus
Andy Slade, Rogers Corporation
Michael Smith, Arlon MED
Steve J Vetter, NSWC Crane
Matthew Walsh, NSWC Crane
Dan Welch, Arlon Materials for Electronics
David Wynants, Taconic Advanced Dielectric Division

This Page Intentionally Left Blank

Table of Contents

Figures

Tables