

Declaration of Alyssa G. Resnick

I, Alyssa G. Resnick, declare as follows:

1. I am the Associate Dean, Technical Services & Collection Development at the University of Southern California, USC Libraries. Technical Services & Collection Development is a department of the University of Southern California's USC Libraries. In my role of Associate Dean, I oversee Technical Services & Collection Development's operations. I have served as Associate Dean since July 2021 and have been in a similar position at USC Libraries since April 2017. I oversee all aspects of procuring and maintaining collections in all formats. The department's functions include acquisitions, cataloging, physical processing, electronic resources management, interlibrary loan and management of the print collections. From my work as Associate Dean, I am knowledgeable about Technical Services & Collection Development and the University of Southern California library system. I am also knowledgeable about the practices of the University of Southern California library system with respect to receiving and cataloging publications, placing publications in circulation, and making publications available for inspection by the public. USC Libraries Technical Services & Collection Development is located at 3434 South Grand Ave., CAL-215, Los Angeles, CA 90089-2810. I am over the age of majority and make this declaration of my own personal knowledge.

2. Under the Library's normal procedure when it receives a new book or journal in the regular course of business, the Library adds the book and invoice details into the integrated library system (ILS) where a received date is recorded and the book is catalogued so that it can be discoverable by the public in the online public catalog. The book is then normally placed into circulation within one of the Libraries where it may be accessed by members of the University of

Southern California community and the general public. Some journals are available but do not circulate outside of the library.

3. The received date in the ILS is recorded the day the book was processed by someone with knowledge that the Library physically received the book. These dates are automatically generated by the ILS in the course of the regularly conducted activity of the Library. Making such records was and is a regular practice of the Library. Based on my knowledge of general practices within the library field, it is my understanding that the Library followed substantially similar procedures in relation to receiving books in 2002. Based on my knowledge of library science in general, I am aware that recording dates as they are received and made available for public access is a widespread or virtually universal practice among major libraries and has been for many decades. I have no reason to believe that the Library changed its procedures significantly between 2002 and 2022.

4. The University of Southern California libraries' catalog system indicates that the following item is maintained in the Library's collection. See attached screenshot of relevant cataloging details, including the received date. The following entry includes bibliographic information and information concerning when the item was received by the Library and made available to the public:

Source:

https://uosc.primo.exlibrisgroup.com/permalink/01USC_INST/hs9vaa/alma991013060409703731

Silicon Processing for the VLSI Era, Vol. 1 & 2

Stanley Wolf and Richard Tauber

Lattice Press, 2000

University of Southern California Libraries Call #: TK7874 W635 2000

Date of public availability: on or around 9/28/2002 as indicated by library's received date in the ILS

5. The bibliographic information concerning this item, as well as the received date, are records maintained by the Library in the normal course of business.

6. I declare under penalty of perjury under the laws of the United States of America that this declaration is true, complete, and accurate to the best of my knowledge. I further acknowledge that willful false statements and the like are punishable by fine or imprisonment, or both (18 U.S.C. § 1001).

Executed at Los Angeles, CA, on October 19, 2022.

Alyssa G. Resnick

Alyssa G. Resnick

Silicon Processing

for the VLSI Era
Volume 1 - Process Technology
Second Edition

S. Wolf and R.N. Tauber

**SILICON PROCESSING
FOR
THE VLSI ERA**

**VOLUME 1:
PROCESS TECHNOLOGY
Second Edition**

STANLEY WOLF Ph.D.

RICHARD N. TAUBER Ph.D.

LATTICE PRESS

Sunset Beach, California

DISCLAIMER

This publication is based on sources and information believed to be reliable, but the authors and Lattice Press disclaim any warranty or liability based on or relating to the contents of this publication.

Published by:

Lattice Press,
Post Office Box 340
Sunset Beach, California 90742, U.S.A.

Cover design by Roy Montibon, Visionary Art Resources, Inc., Santa Ana, CA.

Copyright © 1990 by Lattice Press.

All rights reserved. No part of this book may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording or by any information storage and retrieval system without written permission from the publisher, except for the inclusion of brief quotations in a review.

Library of Congress Cataloging in Publication Data
Wolf, Stanley

Silicon Processing for the VLSI Era
Volume 1 : Process Integration

Includes Index

1. Integrated circuits-Very large scale integration. 2. Silicon. I. Title

86-081923

ISBN 0-961672-4-5

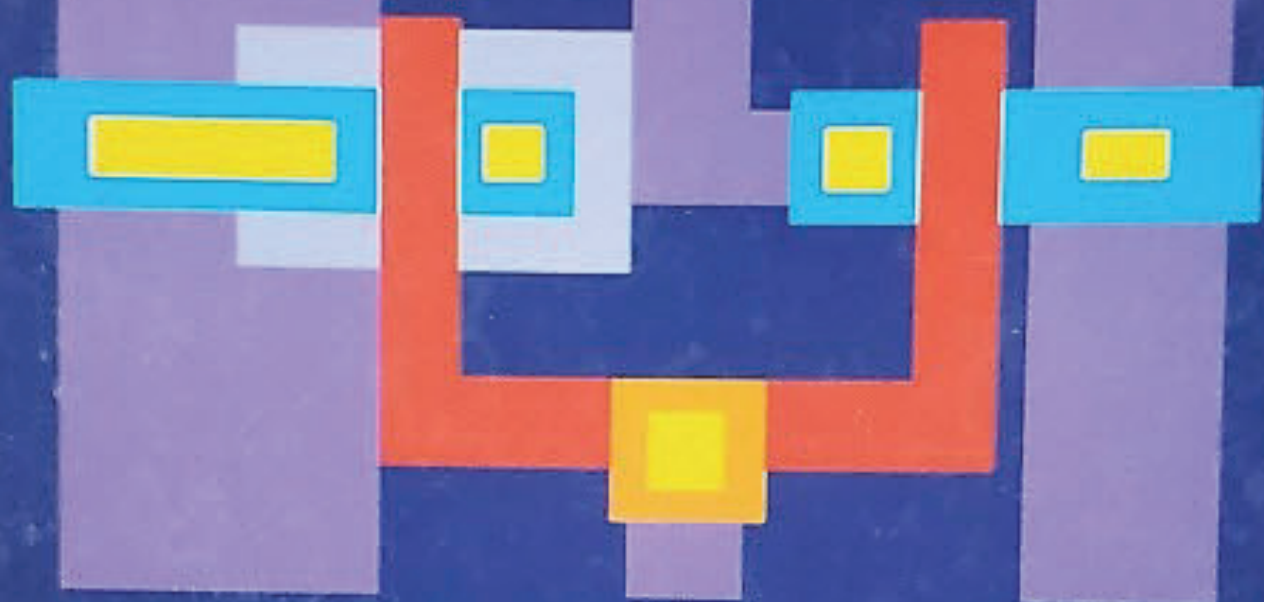
9 8 7 6

PRINTED IN THE UNITED STATES OF AMERICA

Silicon Processing

for the VLSI Era

Volume 2 - Process Integration



S. Wolf

SILICON PROCESSING FOR THE VLSI ERA

VOLUME 2: PROCESS INTEGRATION

STANLEY WOLF Ph.D.
Professor, Department of Electrical Engineering
California State University, Long Beach
Long Beach, California

LATTICE PRESS

Sunset Beach, California

DISCLAIMER

This publication is based on sources and information believed to be reliable, but the authors and Lattice Press disclaim any warranty or liability based on or relating to the contents of this publication.

Published by:

Lattice Press,
Post Office Box 340
Sunset Beach, California 90742, U.S.A.

Cover design by Roy Montibon, Visionary Art Resources, Inc., Santa Ana, CA.

Copyright © 1990 by Lattice Press.

All rights reserved. No part of this book may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording or by any information storage and retrieval system without written permission from the publisher, except for the inclusion of brief quotations in a review.

Library of Congress Cataloging in Publication Data
Wolf, Stanley

Silicon Processing for the VLSI Era
Volume 1 : Process Integration

Includes Index

1. Integrated circuits-Very large scale integration. 2. Silicon. I. Title

86-081923

ISBN 0-961672-4-5

9 8 7 6

PRINTED IN THE UNITED STATES OF AMERICA

Declaration of Alyssa G. Resnick

I, Alyssa G. Resnick, declare as follows:

1. I am the Associate Dean, Technical Services & Collection Development at the University of Southern California, USC Libraries. Technical Services & Collection Development is a department of the University of Southern California's USC Libraries. In my role of Associate Dean, I oversee Technical Services & Collection Development's operations. I have served as Associate Dean since July 2021 and have been in a similar position at USC Libraries since April 2017. I oversee all aspects of procuring and maintaining collections in all formats. The department's functions include acquisitions, cataloging, physical processing, electronic resources management, interlibrary loan and management of the print collections. From my work as Associate Dean, I am knowledgeable about Technical Services & Collection Development and the University of Southern California library system. I am also knowledgeable about the practices of the University of Southern California library system with respect to receiving and cataloging publications, placing publications in circulation, and making publications available for inspection by the public. USC Libraries Technical Services & Collection Development is located at 3434 South Grand Ave., CAL-215, Los Angeles, CA 90089-2810. I am over the age of majority and make this declaration of my own personal knowledge.

2. Under the Library's normal procedure when it receives a new book or journal in the regular course of business, the Library adds the book and invoice details into the integrated library system (ILS) where a received date is recorded and the book is catalogued so that it can be discoverable by the public in the online public catalog. The book is then normally placed into circulation within one of the Libraries where it may be accessed by members of the University of

Southern California community and the general public. Some journals are available but do not circulate outside of the library.

3. The received date in the ILS is recorded the day the book was processed by someone with knowledge that the Library physically received the book. These dates are automatically generated by the ILS in the course of the regularly conducted activity of the Library. Making such records was and is a regular practice of the Library. Based on my knowledge of general practices within the library field, it is my understanding that the Library followed substantially similar procedures in relation to receiving books in 2003. Based on my knowledge of library science in general, I am aware that recording dates as they are received and made available for public access is a widespread or virtually universal practice among major libraries and has been for many decades. I have no reason to believe that the Library changed its procedures significantly between 2003 and 2022.

4. The University of Southern California libraries' catalog system indicates that the following item is maintained in the Library's collection. See attached screenshot of relevant cataloging details, including the received date. The following entry includes bibliographic information and information concerning when the item was received by the Library and made available to the public:

Source:

https://uosc.primo.exlibrisgroup.com/permalink/01USC_INST/hs9vaa/alma991014413739703731

Analysis and design of digital integrated circuits: In deep submicron technology

McGraw-Hill 2004 3rd edition

Hodges, David A. et al.

University of Southern California Libraries Call #: TK7874.65 H64 2004

Date of public availability: on or around 9/10/2003 as indicated by library's received date in the ILS

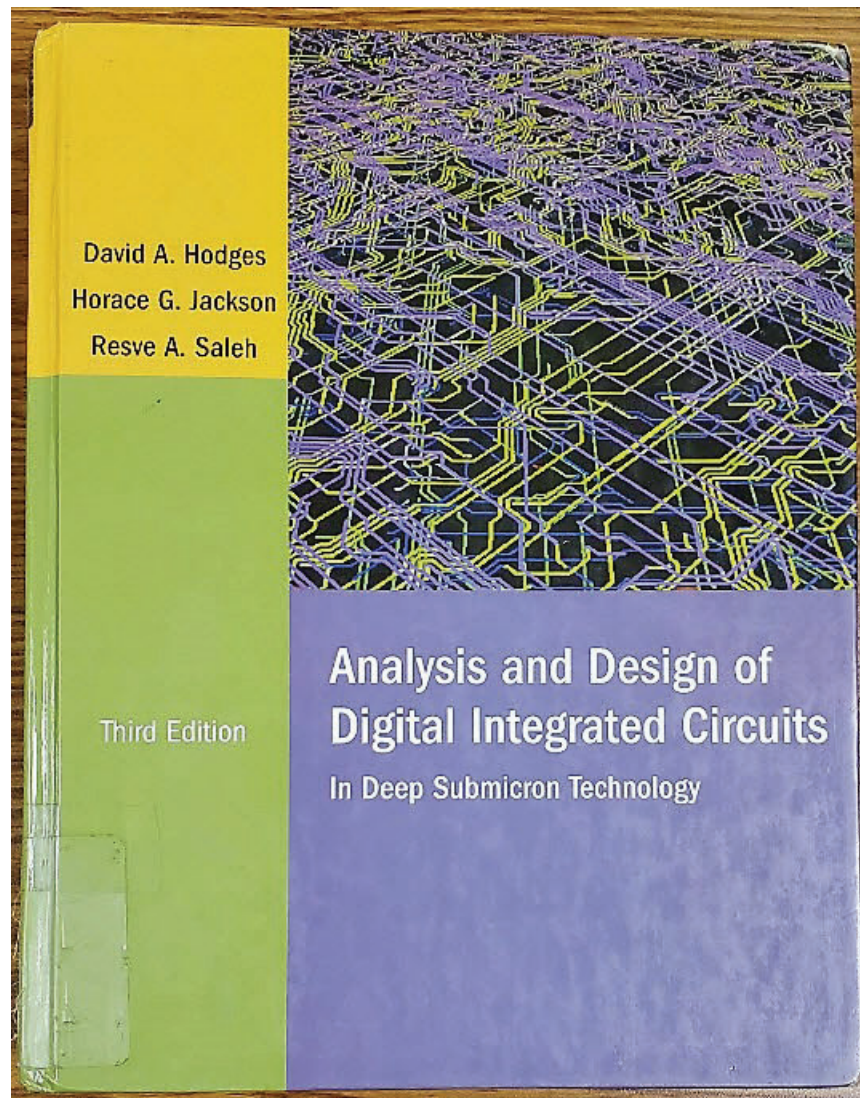
5. The bibliographic information concerning this item, as well as the received date, are records maintained by the Library in the normal course of business.

6. I declare under penalty of perjury under the laws of the United States of America that this declaration is true, complete, and accurate to the best of my knowledge. I further acknowledge that willful false statements and the like are punishable by fine or imprisonment, or both (18 U.S.C. § 1001).

Executed at Los Angeles, CA, on October 19, 2022.

Alyssa G. Resnick

Alyssa G. Resnick



Analysis and Design of Digital Integrated Circuits

In Deep Submicron Technology

THIRD EDITION

David A. Hodges

University of California, Berkeley

Horace G. Jackson

University of California, Berkeley

Resve A. Saleh

University of British Columbia



Higher Education

Boston Burr Ridge, IL Dubuque, IA Madison, WI New York San Francisco St. Louis
Bangkok Bogotá Caracas Kuala Lumpur Lisbon London Madrid Mexico City
Milan Montreal New Delhi Santiago Seoul Singapore Sydney Taipei Toronto

The McGraw-Hill Companies



Higher Education

ANALYSIS AND DESIGN OF DIGITAL INTEGRATED CIRCUITS: IN DEEP SUBMICRON TECHNOLOGY,
THIRD EDITION

Published by McGraw-Hill, a business unit of The McGraw-Hill Companies, Inc., 1221 Avenue of the Americas, New York, NY 10020. Copyright © 2004, 1988 by The McGraw-Hill Companies, Inc. All rights reserved. No part of this publication may be reproduced or distributed in any form or by any means, or stored in a database or retrieval system, without the prior written consent of The McGraw-Hill Companies, Inc., including, but not limited to, in any network or other electronic storage or transmission, or broadcast for distance learning.

Some ancillaries, including electronic and print components, may not be available to customers outside the United States.

This book is printed on acid-free paper.

1 2 3 4 5 6 7 8 9 0 DOC/DOC 0 9 8 7 6 5 4 3

ISBN 0-07-228365-3

Publisher: Elizabeth A. James

Senior sponsoring editor: Carlise Paulson

Senior developmental editor: Emily J. Lupash

Marketing manager: Dawn R. Hercier

Project manager: Joyce Watters

Senior production supervisor: Laura Fuller

Lead media project manager: Audrey A. Reiter

Senior media technology producer: Phillip Meek

Senior coordinator of freelance design: Michelle D. Whitaker

Cover/interior designer: Argosy Publishing

Cover image: © X-Architecture Routing Illustration Courtesy of Cadence Design Systems, Inc.

Lead photo research coordinator: Carrie K. Burger

Compositor: Lachina Publishing Services

Typeface: 10.5/12 Times Roman

Printer: R. R. Donnelley Crawfordsville, IN

Library of Congress Cataloging-in-Publication Data

Hodges, David A., 1937-

Analysis and design of digital integrated circuits : in deep submicron technology. David A. Hodges, Horace G.

Jackson, Resve Saleh.—3rd ed

p. cm.—(McGraw-Hill series in electrical engineering)

Includes index.

ISBN 0-07-228365-3

1. Digital integrated circuits—Design and construction. 2. Integrated circuits—Ultra large scale integration.
3. Electric circuit analysis. I. Jackson, Horace G. II. Saleh, Resve. III. Title. IV. Series.

TK7874.65.H64 2004
621.3815—dc21

2003051006
CIP

www.mhhe.com