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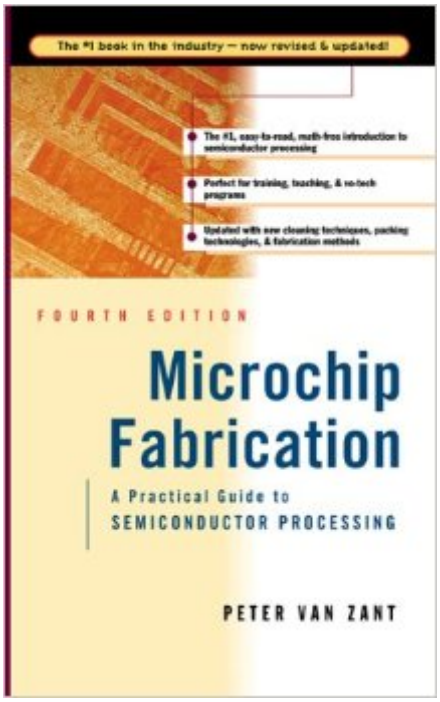
Microchip Fabrication: A Practical Guide To Semiconductor Processing



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Synopsis

Novice-friendly intro to semiconductor processing.The most readable and comprehensive guide to semiconductorprocessing, Peter Van Zant’s Microchip Fabrication is considered the bible of basic microchip technology. Now in an updated new fourth edition, this completely math-free introduction to a complex field is an efficient tool for high-powered engineers and technology-clueless salespeople alike. You’ll find fully illuminating, easy-reading explanations of semiconductor materials and process chemicals...contamination control...process yields...all aspects of basic patterning....doping, deposition, and metallization...wafer, device, and circuit evaluation...semiconductor devices and integrated circuit formation and types...and packaging. This new fourth edition puts at your fingertips new sections on: *Copper metallization and damascene patterning*BGA and CSP*Cutting-edge cleaning techniques*And more!

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Customer Reviews

I read two previous editions of this book. When I heard the 4th edition, I cannot wait to buy one. This book is written so well that it’s good for readers from inside and outside of the industry. The coverage of the new development of technology is especially useful. I also like chapter 15 very much. The author discusses the business aspects of wafer fabrication, which is not seen very many times in a tech book. The author really knows what a reader would like to learn, opposing to that a lot authors only write for themseles. It is an excellent book.

This is an excellent book for someone who knows little about semiconductors. It goes into historical and current wafer processing trends and discusses a few of the challenges for future techonolgy nodes. The book touches on most parts of fabrication and presents simplified versions of the theory and equipment involved. Not for advanced readers.

English is not my first language, I still find this book painful to read. It took me a weekend to munch down the top one third of this book, a biography of Seymour Cray, and six Japanese comic books. I find this book among them, the worst prepared one.With so many errors in it, I kept grabbing my hair. Many mistakes are so easy to spot, I can usually randomly filp over ten pages, and spot an error. Many of them are really serious, they really can mislead a student, if he/she lacked proper training in science. Say on one page, ozone was mistakenly printed as O2 rather than O3. There are some other unbalanced chemical formula as well. Some math formula are also poorly written or presented.Read it, but be careful. It can be a mine field.

If you have or are in the process of getting your EE, don’t bother with this book. As the title says, it’s a "Practical Guide" for folks that either have an interest in the topic or wish to get a bit deeper into the issues involved in wafer and semiconductor manufacturing due to job requirements etc... it is not a text book.I would have given the book 5 stars except there are several glaring issues with this book. Given the target audience and general education level of its readers, I think some of the issues are inexcusable.Typos and grammatical errors abound in this book. The Editor at McGraw Hill must have been asleep or been so completely uninterested in the topic that they didn’t bother to check. Also, there are issues with decimal point placement throughout the book. It’s sufficiently technical that someone should have bothered to verify the figures before publishing. I also would like to have seen higher quality illustrations/pictures and some logic applied to their placement.This book is due for an update SOON. It positions die shifts to 180 nanometers as an up and coming event. Intel currently has 90 nanometer manufacturing up and running, with products entering the channel in 4Q03. Not to mention, graphics chip companies and their fab partners have made the shift to 130 nanometers. These process and manufacturing changes bring a whole host of new issues, challenges, opportunities and technologies to the mix.All in all, this is a good book.

[A review of the 5th edition.]Zant gives an update of his long running book on chip making. It is useful as a quick overview of the salient steps used by many fabs. The text starts with a precis of

the industry’s history, and, naturally, the seminal and continued significance of Moore’s Law.The wafer fabrication pages describe the predominant Chemical Vapour Deposition method. But the book also finds space for a quick explanation of Molecular Beam Epitaxy. Though the latter is still largely a research method.Patterning and photolithography are vital processing steps. You should have a solid grasp of these ideas from the relevant chapters. Later steps of layer deposition and metallisation build up the circuit.A lot of the text is basically unchanged from earlier editions. Since many key ideas have remained constant for decades. Rather, it has been the industry’s singular success in applying those ideas to ever greater precision. Hence, the book explains why the decreasing linewidths (now in the deep submicron of around 0.18) and the move to 300mm wafers have kept us moving along Moore’s Law.The book is roughly at an undergraduate level in material science or electrical engineering. [Professionals should seek more detailed texts.]

This book certainly lays out the basics of integrated circuit manufacturing methods and techniques, and does it at a level that a non-EE fellow like me can appreciate. However, the book is riddled with typos, misapplied homonyms (a "quartz vile" instead of a "quartz vial", for example), and some "facts" that are just plain wrong (copper coils for the heating elements in a resistance-heated furnace? I don’t think so!). Shame on the author and the publisher for not performing a thorough proofreading of this otherwise useful text.

I’ll be short in sweet. I’ve read some of the other revies. And let me tell you from a guy that is in the semiconductor industry, the grammatical mistakes are many but they are not enough to misguide you as to the theory contained within the text. Everyone in the industry knows that ozone is O3, so when the author uses O2 in some areas, it is an understanable mistake. I do wish the author would have included a little more of the math behind the industry, but he did afterall forewarn us that it was not going to be in here. So the book does what the title states, gives a practical guide to semiconductor processing.

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