

Hints, Tips and Solutions

Mustafa Taner, Applications and Support Engineer

Q. How can I extract BSIM4 parameters using *UTMOST III*?

A. The BSIM4_FI routine in *UTMOST III* MOS module should be used for data collection and BSIM4 SPICE model parameter extraction. The BSIM4_FI routine features are similar to the BSIM3_MG routine. The BSIM4_FI routine will collect four types of measured data curves from each device:

- 1) IDS/VGS @ low VDS bias.
- 2) IDS/VDS @ VBS=0V.
- 3) IDS/VGS @ High VDS bias.
- 4) IDS/VDS @ High VBS bias.

After the data collection is completed the menu item "Measure&extract" in the Fit Variables screen should be set to "1". This will enable the automatic parameter extraction and refinement process. (Figure 1.)

If the "Measure&extract" flag is set to "1" the extraction will start after the measurement is completed or after

FIT VARIABLES		
FITTING VARIABLES		
1	Measure&extract	1
2	Extract_ID	1
3	Extract_IDV	0
4	Extract_IDL	0
5	Extract_IDSD	0
6	Extract_NCH	0
7	Extract_XJ	0
8	DELCHDD(0-2)	0
9	VDS_Low_VDS	-4
10	VDS_high_VDS	4
11	VDS_Low_VBS	-4
12	VDS_high_VBS	4

QUIT

Figure 1. BSIM4_FI routine "Fitting Variables" screen.

LOCAL OPTIMIZATION SCREEN					
Strategy # 51		idvg_large_bsim4		BSIM4_FI	
1	VT0	IS	IS	IS	IS
2	IS	IS	IS	IS	IS
3	IS	IS	IS	IS	IS
4	IS	IS	IS	IS	IS

Define Strategy Select Strategy Define Plotlist PRINT

Plot File: [path to file] QUIT

Figure 2. Local Optimization Strategy#51 : idvg_large_bsim4

loading the log file and pressing the "Measure" button will start the extraction. The BSIM4_FI routine is very easy to use and the routine will extract and refine BSIM4 parameters with user inputting only few process related parameters (TOX, XJ, NCH) in to the fit and opt columns of the parameters screen. The extracted parameters will be copied into the parameters screen.

The BSIM4_FI routine is an automatic parameter extraction and refinement routine. The simulation and local/Global optimization should be performed using the ALL_DC routines. The measured data collected with BSIM4_FI routine can be shared by any ALL_DC routine.

After the parameter extraction is completed the quality of the fits should be examined by running the SPICE simulation against the measured data in ALL_DC routine. The further fine tuning of the parameters can be achieved by using the Local optimization strategies. The local optimization strategies between Strategy#51 and Strategy#60 are developed by Silvaco specifically for the BSIM4 model parameter optimization. (Figure 2.)

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Utmost Iii Extractions Manual

James Park



Utmost Iii Extractions Manual:

Cmos Rf Modeling, Characterization And Applications M Jamal Deen,Tor A Fjeldly,2002-04-10 CMOS technology has now reached a state of evolution in terms of both frequency and noise where it is becoming a serious contender for radio frequency RF applications in the GHz range Cutoff frequencies of about 50 GHz have been reported for 0.18 μ m CMOS technology and are expected to reach about 100 GHz when the feature size shrinks to 100 nm within a few years This translates into CMOS circuit operating frequencies well into the GHz range which covers the frequency range of many of today's popular wireless products such as cell phones GPS Global Positioning System and Bluetooth Of course the great interest in RF CMOS comes from the obvious advantages of CMOS technology in terms of production cost high level integration and the ability to combine digital analog and RF circuits on the same chip This book discusses many of the challenges facing the CMOS RF circuit designer in terms of device modeling and characterization which are crucial issues in circuit simulation and design

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Swarm, Evolutionary, and Memetic Computing Bijaya Ketan Panigrahi,Swagatam Das,Ponnuthurai Nagaratnam Suganthan,Pradipta Kumar Nanda,2012-12-16 This book constitutes the refereed proceedings of the Third International Conference on Swarm Evolutionary and Memetic Computing SEMCCO 2012 held in Bhubaneswar India in December 2012 The 96 revised full papers presented were carefully reviewed and selected from 310 initial submissions The papers cover a wide range of topics in swarm evolutionary memetic and other intelligent computing algorithms and their real world

applications in problems selected from diverse domains of science and engineering Computer Aided Design Of Micro-And Nanoelectronic Devices Chinmay Kumar Maiti,2016-10-27 Micro and nanoelectronic devices are the prime movers for electronics which is essential for the current information age This unique monograph identifies the key stages of advanced device design and integration in semiconductor manufacturing It brings into one resource a comprehensive device design using simulation The book presents state of the art semiconductor device design using the latest TCAD tools Professionals researchers academics and graduate students in electrical electronic engineering and microelectronics will benefit from this reference text **IEICE Transactions on Electronics** ,1999 Extraction Metallurgy Swamini Chopra,Thoguluva Vijayaram,2024-01-10 Extraction Metallurgy New Perspectives explores the dynamic world of metallurgical processes and materials extraction This volume offers fresh insight into the latest and cutting edge research that will help both new learners and seasoned professionals Authored by distinguished metallurgists and researchers this book sheds light on the intricacies of metallurgical processes and their real world applications innovative approaches and methodologies that are reshaping the metallurgical landscape and global perspectives on extraction metallurgy presenting diverse case studies and examples from across the world Written with the needs of researchers and non native English speakers in mind the book employs clear and concise language making complex topics accessible to a wide audience Extraction Metallurgy New Perspectives is a must read for students academics and professionals engaged in metallurgical research and industrial applications **Utech Asia'97** ,1997 Patient Centric Blood Sampling and Quantitative Analysis Neil Spooner,Emily Ehrenfeld,Joe Siple,Mike S. Lee,2023-10-31 PATIENT CENTRIC BLOOD SAMPLING AND QUANTITATIVE ANALYSIS Authoritative resource providing a complete overview of patient centric blood sampling as well as its benefits and challenges Patient Centric Blood Sampling and Quantitative Analysis focuses on the growing interest in alternative means to standard phlebotomy and analytical workflows for the collection and analysis of high quality human biological samples for the quantitative determination of circulating drugs their metabolites and endogenous substances for clinical trials routine healthcare and neonatal screening The book clearly explains the benefits and constraints of having patients collect small volumes of blood in locations outside of a clinic e g at home including patient convenience less invasive procedures increased frequency of sampling applicability to collecting samples from the young elderly and those in remote locations greater frequency and lower cost per sample Readers will learn about approaches for successfully implementing patient centric sampling workflows in a number of scenarios including the clinical setting and in the analytical laboratory Edited by four recognized experts in this field with additional specialists in the discipline enlisted to write the component chapters enabling greater depth and detail to be added and further raising the scientific standing of the publication Patient Centric Blood Sampling and Quantitative Analysis includes information on Basics of patient centric blood sampling and techniques and approaches that are available and in development for the collection and analysis of the samples Science behind patient

centric blood sampling and its implications regarding human healthcare and wellbeing Application areas of patient centric sampling including drug development clinical chemistry pathology therapeutic drug monitoring and more Practical approaches to successful implementation for existing and developing purposes and workflows and case studies to support implementation within an organization Giving the reader a broad understanding of what patient centric sampling is and where it might be applied for existing and potential future areas Patient Centric Blood Sampling and Quantitative Analysis is an essential resource on the subject for many different types of laboratories areas of clinical research and healthcare including those in pharmaceutical clinical and research functions

The Cyanide Process of Gold Extraction James Park,1904 *Springer Handbook of Marine Biotechnology* Se-Kwon Kim,2015-01-21 This Springer Handbook provides for the first time a complete and consistent overview over the methods applications and products in the field of marine biotechnology A large portion of the surface of the earth ca 70% is covered by the oceans More than 80% of the living organisms on the earth are found in aquatic ecosystems The aquatic systems thus constitute a rich reservoir for various chemical materials and bio chemical processes Edited by a renowned expert with a longstanding experience and including over 60 contributions from leading international scientists the Springer Handbook of Marine Biotechnology is a major authoritative desk reference for everyone interested or working in the field of marine biotechnology and bioprocessing from undergraduate and graduate students over scientists and teachers to professionals Marine biotechnology is concerned with the study of biochemical materials and processes from marine sources that play a vital role in the isolation of novel drugs and to bring them to industrial and pharmaceutical development Today a multitude of bioprocess techniques is employed to isolate and produce marine natural compounds novel biomaterials or proteins and enzymes from marine organisms and to bring them to applications as pharmaceuticals cosmeceuticals or nutraceuticals or for the production of bioenergy from marine sources All these topics are addressed by the Springer Handbook of Marine Biotechnology The book is divided into ten parts Each part is consistently organized so that the handbook provides a sound introduction to marine biotechnology from historical backgrounds and the fundamentals over the description of the methods and technology to their applications but it can also be used as a reference work Key topics include Marine flora and fauna Tools and methods in marine biotechnology Marine genomics Marine microbiology Bioenergy and biofuels Marine bioproducts in industrial applications Marine bioproducts in medical and pharmaceutical applications and many more

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