

Class Introduction



Prof. Hanh-Phuc Le

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<http://ipower3es.ucsd.edu/>

ECE 102 – Introduction to Active Circuit Design

Hanh-Phuc Le

Associate Professor, UC San Diego

- **Ph.D.** **UC Berkeley, USA** **2013**
- **M.S.** **KAIST, Korea** **2006**
- **B.S.** **HUST, Hanoi, Vietnam** **2003**

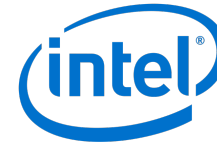


- **Prior experience:**

- University of Colorado Boulder 2016 – 2019
- Lion Semi., San Francisco, CA 2012 – 2015
- Rambus, Sunnyvale, CA 2012
- Intel, Beaverton, OR 2009
- Oracle, Santa Clara, CA 2008
- JDA Tech., Korea 2004 – 2007
- VAST, Vietnam 2002 – 2004



Rambus

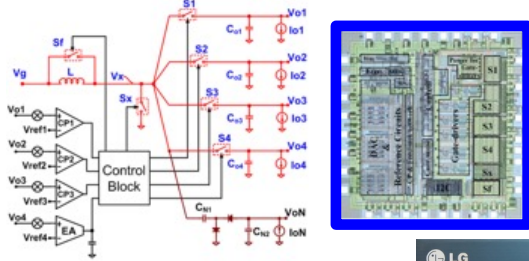


University of Colorado
Boulder



The Quest for iPower Circuits

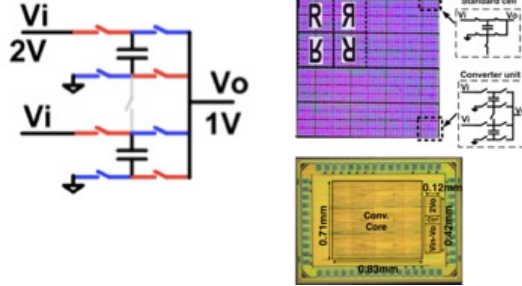
SIMO ('07-'09)



*in LG SH150A (3G)
AMOLED*

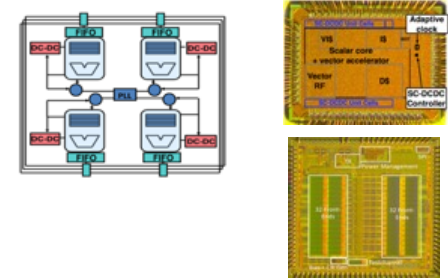


SC – FIVR ('10-'13)



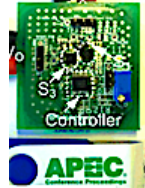
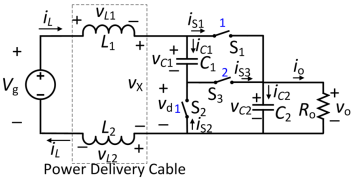
*1st hi-perf. SC conv.
1W/mm², sub-ns response*

Integ. Sys. and Func. ('14-'16)

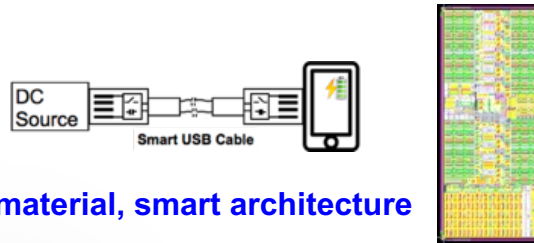


*1st core with SC ripple conv.
iPower for brain implants*

Hybrid Co . ('13~)

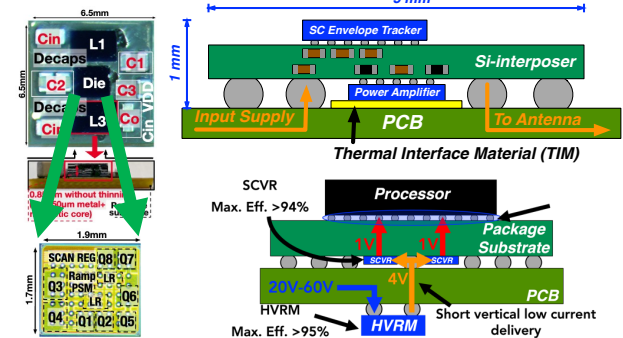


Integrate w/ Env. ('17~)



material, smart architecture

High-V, Large Conv. ('18~)



Information

Time:	Lecture: Tuesday/Thursday 3:30 PM ~ 4:50 PM, PCYNH 122 (in-person) Discussion Section: Wednesday 11:00 AM ~ 11:50 AM, CENTR 216 (in-person)
Instructor:	Prof. Hanh-Phuc Le (hanhphuc@ucsd.edu) Office Hours: Monday (Zoom)/Wednesday (Zoom) 2:00 PM ~ 3:00 PM, Zoom meeting (or by appointment)
TAs:	Hieu Pham <m1pham@ucsd.edu> Saket Jha <sajha@ucsd.edu> Likhit Valavala <lvalavala@ucsd.edu> Kristopher Ngo <kzngo@ucsd.edu> Office Hours: at the lab hour over Zoom
Admin:	Bethany Carson (bacarson@eng.ucsd.edu) Jacobs Hall, Room 2904
Course Websites:	https://canvas.ucsd.edu/
Grading:	10% Quiz 25% Homework + Labs (lowest score will be dropped) 30% Midterms 35% Final Plus and Minus grades will be assigned.
Recommended Textbook:	Sedra and Smith, Microelectronic Circuits, 7th ed., Oxford, 2015.
Reference Textbook:	Razavi, Fundamental of Microelectronics, 2nd ed., Wiley, 2013.
Prerequisites:	ECE 35, ECE 45, ECE 65, ECE 100. (ECE 100 can be a co-requisite.)

Class Contents

Week	Date	Lecture	Content	Assignment
1	Jan 9, 2024	L1+L2	Introduction + MOS Device Physics	
	Jan 11, 2024	L2	MOS Device Physics	
2	Jan 16, 2024	L3	Small Signal Model	HW1 Out
	Jan 18, 2024	L3	Small Signal Model	
3	Jan 23, 2024	L4	SPICE, CAD Tutorial	HW1 Due HW2 Out
	Jan 25, 2024	L5	Elementary Amplifier Configurations	
4	Jan 30, 2024	L5	Elementary Amplifier Configurations	HW2 Due HW3 Out
	Feb 1, 2024	L6	MOS Amplifiers & Biasing	
5	Feb 6, 2024		Midterm 1	HW3 Due HW4 Out
	Feb 8, 2024	L6	MOS Amplifiers & Biasing	
6	Feb 13, 2024	L7	Multistage Amplifiers	HW4 Due HW5 Out
	Feb 15, 2024	L7	Multistage Amplifiers	
7	Feb 20, 2024	L8	Differential Amplifiers	HW5 Due HW6 Out
	Feb 22, 2024	L8	Differential Amplifiers	
8	Feb 27, 2024	L8	Differential Amplifiers	HW6 Due HW7 Out
	Feb 29, 2024		Midterm 2	
9	Mar 5, 2024	L9	Frequency response	
	Mar 7, 2024	L9	Frequency response	HW7 Due
10	Mar 12, 2024	L9	Frequency response	
	Mar 14, 2024		Class Review	
	Mar 19, 2024		Final Exam (3:00p-5:59p)	

Class Logistics

- **All communications on Canvas**
 - Calendar
 - Zoom meeting link
 - Media Gallery
 - Class videos
 - Files
 - Lecture slides
 - CAD Tools materials
 - Assignments
 - Assignments and Exams: Gradescope
 - Online submission, PDF or picture
 - Need to submit to the right section of problems for easy grading
 - Discussions: Piazza
 - Grades: Gradescope and Canvas
 - Modules: follow all main activities