

Douglas R. Holberg, Ph.D.
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Education

B.S.E.E. - 1977, Texas A&M University, College Station, TX.

M.S.E. - 1989, The University of Texas, Austin, TX.

Ph.D. - 1992, The University of Texas, Austin, TX.

Experience

Intellectual Property Technical Consultant –

Apr 2013 – Present: Principal

Patent analysis for licensing and litigation (offensive and defensive)

Patent analysis and review for valuation

Inter Partes Review

Expert witness

Teardown, electrical measurements and analysis

Simulation and modeling

Technical consulting

Jan 2008 – Mar 2013

Patent analysis for licensing and litigation (offensive and defensive)

Technical support for patent prosecution

Patent analysis and review for valuation

Silicon Laboratories –

Jun 2005 – Jan 2008: V. P. of Technology

Dec 2003 – Jun 2005: Director of Engineering, MCU Products

Cygnal Integrated Products - Feb. 1999 to Dec 2003 (acquired by Silicon Labs Dec 2003)

Vice President of Engineering, Chief Technical Officer, Co-founder

Concurrent to the position at Cygnal, I served as Adjunct Assistant Professor at the University of Texas at Austin, and Technical Advisory Boards for Silicon Metrics and Celite Systems.

Adjunct Assistant Professor, University of Texas at Austin – 1995-2001

Taught “CMOS Analog Circuit Design” Graduate class: EE397K and Undergraduate class: EE338L

Crystal Semiconductor Corp. (Cirrus Logic) - Sep. 1996 to Feb. 1999

Director of Imaging and Video Products (CCD interface, CMOS imagers, TV encoders, etc.)

Crystal Semiconductor Corp. (Cirrus Logic) - Oct. 1992 to Sep. 1996

Design Manager for VLSI mixed-signal products including telecommunications and disk drive read channel devices.

Independent Consultant - Aug. 1987 to Oct. 1992

Taught a short-course entitled “CMOS Analog Integrated Circuit Design” in Berlin, Germany twice per year as a part of the “Berlin Continuing Engineering Education Program.” In addition, this course was taught at Analog Devices BV, Ireland, Aug. 1990.

Lectured at Baylor University's Department of Engineering (Spring '89, Spring '91).

Consultant for Advanced Micro Devices, Crystal Semiconductor, and other companies on projects relating to switched-capacitor filters, operational amplifiers, latchup, and the ISDN analog interface.

Crystal Semiconductor Corp. - Oct. 1984 to Aug. 1987

Project leader on the CS7008 Universal Filter--a universal programmable filter using novel switched-capacitor techniques. This design was completed in a 3 μ m silicon-gate double-polysilicon CMOS process.

Texas Micro Engineering, Inc. - June 1980 to Oct. 1984

Project leader on TME3030 Sense Amplifier/Filter--a dual-channel switched-capacitor filter circuit to be used in a medical electronic application. Co-designed a gate-array platform customized for medical and consumer products. Performed extensive device characterization of MOS transistors. This work included characterization of noise performance and characterization of transistors operating in weak inversion.

Mostek, Inc., Carrollton, TX. - Jan. 1978 to June 1980

Circuit designer. Served as project leader on MK5387 DTMF generator.

Inventions

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| 1. | 11,786,126 | Devices, systems and methods for using and monitoring medical devices |
| 2. | 11,596,308 | Devices, systems and methods for using and monitoring medical devices |
| 3. | 11,497,964 | Devices, Systems And Methods For Using And Monitoring Sports Equipment And Sports Activities |
| 4. | 11,071,456 | Devices, systems and methods for using and monitoring medical devices |
| 5. | 10,492,686 | Devices, systems and methods for using and monitoring medical devices |
| 6. | 8,010,819 | Microcontroller unit (MCU) with power saving mode |
| 7. | 7,719,595 | Preview mode low resolution output system and method |
| 8. | 7,660,968 | Reconfigurable interface for coupling functional input/output blocks to limited number of I/O pins |
| 9. | 7,613,901 | Comparators in IC with programmably controlled positive / negative hysteresis level and open-drain/push-pull output coupled to crossbar switch or rising/falling edge interrupt generation |
| 10. | 7,511,465 | Digital pulse width modulated power supply with variable LSB |
| 11. | 7,504,902 | Precision oscillator having linbus capabilities |
| 12. | 7,504,900 | Integrated circuit package including programmable oscillators |
| 13. | 7,502,883 | USB integrated module |
| 14. | 7,498,962 | Analog-to-digital converter with low power track-and-hold mode |
| 15. | 7,441,131 | MCU with power saving mode |
| 16. | 7,421,251 | Precise frequency generation for low duty cycle transceivers using a single crystal oscillator |
| 17. | 7,382,181 | Method and apparatus for tuning GMC filter |
| 18. | 7,323,855 | Digital pulse width modulated power supply with variable LSB |
| 19. | 7,315,200 | Gain control for delta sigma analog-to-digital converter |
| 20. | 7,304,679 | Preview mode low resolution output system and method |
| 21. | 7,289,145 | Correlated double sampling variable gain amplifier circuit for use in a digital camera |
| 22. | 7,286,176 | CCD imager analog processor systems and methods |
| 23. | 7,256,611 | Cross-bar matrix with LCD functionality |
| 24. | 7,171,542 | Reconfigurable interface for coupling functional input/output blocks to limited number of i/o pins |
| 25. | 7,164,311 | Method and apparatus for tuning GMC filter |
| 26. | 7,061,421 | Flash ADC with variable LSB |
| 27. | 6,950,047 | Method and apparatus for combining outputs of multiple DACs for increased bit resolution |
| 28. | 6,922,164 | SAR analog-to-digital converter with abort function |
| 29. | 6,891,487 | Capacitor calibration in SAR converter |
| 30. | 6,879,004 | High voltage difference amplifier with spark gap ESD protection |
| 31. | 6,724,336 | Segmented D/A converter with enhanced dynamic range |
| 32. | 6,720,999 | CCD imager analog processor systems and methods |
| 33. | 6,686,957 | Preview mode low resolution output system and method |
| 34. | 6,617,934 | Phase locked loop circuits, systems, and methods |
| 35. | 6,448,917 | DAC using current source driving main resistor string |
| 36. | 6,400,300 | D/A converter street effect compensation |
| 37. | 6,384,763 | Segmented D/A converter with enhanced dynamic range |
| 38. | 6,288,661 | A/D converter with voltage/charge scaling |
| 39. | 6,285,536 | High voltage input pad system |
| 40. | 6,172,361 | Methods for mounting an imager to a support structure and circuitry and systems embodying the same |
| 41. | 6,038,116 | High voltage input pad system |
| 42. | 4,849,662 | Switched-capacitor filter having digitally-programmable capacitive element |
| 43. | 4,492,927 | Offset voltage compensation circuit |
| 44. | 4,390,754 | Tone generator circuit |

Publications

Ka Y. Leung, Kafai Leung, Douglas R. Holberg, "A Dual Low Power $\frac{1}{2}$ LSB INL 16b/1Msamples/s SAR A/D Converter with on-chip Microcontroller, *Proc. 2006 Asian Solid State Circuits Conference*, Nov 2006.

Welland, D.; Phillip, S.; Tuttle, T.; Ka Leung; Dupuie, S.; Holberg, D, et al., "Implementation of a digital read/write channel with EEPR4 detection," *IEEE Transactions on Magnetics*, Volume: 31 , Issue: 2, 1995.

Welland, D.; Phillip, S.; Ka Leung; Anderson, K.; Armstrong, A.; Tuttle, T.; Dupuie, S.; Holberg, D.; et al. , "An EEPR4 Read/Write Channel," *Digest of the Magnetic Recording Conference* 1994.

D. Welland, S. Phillip, K. Leung, G. Tuttle, S. Dupuie, D. Holberg, et al., "A Digital Read/Write Channel with EEPR4 Detection," *Proc. IEEE International Solid-State Circuits Conference*, Feb. 1994.

Welland, D.; Phillip, S.; Tuttle, T.; Ka Leung; Dupuie, S.; Holberg, D.; Jack, R.; Sooch, N.; Behrens, R.; Anderson, K.; Armstrong, A.; Bliss, W.; Dudley, T.; Foland, B.; Glover, N.; King, L., "Implementation of a digital read/write channel with EEPR4 detection," *IEEE Transactions on Magnetics*, Vol 31, No. 2, Mar. 1995.

Ronn B. Brashear, Douglas R. Holberg, M. Ray Mercer, and Lawrence Pillage, "ETA: Electrical-Level Timing Analysis," *Proc. IEEE International Conference on Computer-Aided Design*, Nov. 1992.

Ashok Balivada, Douglas R. Holberg, Lawrence T. Pillage, "Calculation and Application of Time-Domain Waveform Sensitivities in Asymptotic Waveform Evaluation," *Custom Integrated Circuits Conference*, May 1991.

Douglas R. Holberg, Santanu Dutta, Lawrence Pillage, "DC Parameterized Piecewise-Function Transistor Models for Bipolar and MOS Logic Stage Delay Evaluation," *Proc. IEEE International Conference on Computer-Aided Design*, Nov. 1990.

Douglas R. Holberg, "Digitally Programmable Filter Based on Standard Cell Design," *IEEE Analog/Digital VLSI Workshop*, Sept. 1986.

Tom Dille, Douglas Holberg, and Roger Taylor, "Programmable Filter Chip and its PC-Based Tools Offer New Analog Solutions," *Electronic Design*, May 29, 1986.

Books

Phillip E. Allen and Douglas R. Holberg, *CMOS Analog Circuit Design*, New York: Holt Rinehart, and Winston, ©1987.

Phillip E. Allen and Douglas R. Holberg, *CMOS Analog Circuit Design*, 2nd Ed, Oxford University Press, ©2002.

Phillip E. Allen and Douglas R. Holberg, *CMOS Analog Circuit Design*, 3rd Ed, Oxford University Press, ©2011.

Other Professional Activities

Served on the "Industrial Electronics Advisory Committee" for the University of Texas Instruction and Materials Center, University of Texas, Austin, 1988-1989.

Baylor University Board of Advocates, 2001 to 2003.

Life Member of IEEE

IPR Case History

Depo	Represented	AIA Review #	Filed	Patent #	Title
Dec-14	Silicon Labs	IPR2014-00728	5/5/2014	7075585	Broadband receiver having a multistandard channel filter
Dec-14	Silicon Labs	IPR2014-00809	5/23/2014	7265792	Television receiver for digital and analog television signals
Dec-14	Silicon Labs	IPR2014-00881	6/4/2014	7251466	Television receiver including an integrated band selection filter
Mar-16	Silicon Labs	IPR2015-00615	1/23/2015	7075585	Broadband receiver having a multistandard channel filter
Mar-16	Silicon Labs	IPR2015-00626	1/26/2015	7265792	Television receiver for digital and analog television signals
No	On Semiconductor	IPR2017-01453	5/19/2017	8854841	High-speed reflected signal detection for primary-side controlled power converters
No	On Semiconductor	IPR2017-01329	4/28/2017	9049764	LED drive circuit with a programmable input for LED lighting
No	On Semiconductor	IPR2016-01588	8/11/2016	6249876	Frequency jittering control for varying the switching frequency of a power supply

No	On Semiconductor	IPR2016-01589	8/11/2016	6249876	Frequency jittering control for varying the switching frequency of a power supply
No	On Semiconductor	IPR2016-01599	8/11/2016	6107851	Offline converter with integrated softstart and frequency jitter
No	On Semiconductor	IPR2016-01600	8/11/2016	7834605	Method and apparatus for maintaining a constant load current with line voltage in a switch mode power supply
No	On Semiconductor	IPR2017-01328	4/28/2017	6845019	Flyback converter
No	On Semiconductor	IPR2018-00377	1/2/2018	7564705	Synchronous rectification circuit for power converters
No	On Semiconductor	IPR2018-00378	1/2/2018	7440298	Synchronous rectification circuit for power converters
No	On Semiconductor	IPR2018-00379	1/2/2018	7796407	Method and apparatus of providing synchronous regulation for offline power converter
Jul-18	On Semiconductor	IPR2017-01907	8/11/2017	6333624	Circuit and method for a switching power supply with primary side transformer sensing

Nov-18	On Semiconductor	IPR2018-00180	11/14/2017	6597221	Power converter circuit and method for controlling
No	On Semiconductor	IPR2018-01539	8/14/2018	7944272	Constant current circuit
No	On Semiconductor	IPR2018-00165	11/7/2017	6414471	Off-line converter with digital control
10/20/2020	Advanced Micro Devices	IPR2019-01525	8/28/2019	6239614	Semiconductor integrated circuit device
3/30/2021	Xilinx	IPR2020-01219	7/17/2020	8487659	Comparator with adaptive timing
8/23/2021					
4/9/2021	Xilinx	IPR2020-01210	7/17/2020	10250250	Bootstrapped switching circuit
8/5/2021					
4/23/2021	Xilinx	IPR2020-01336	7/20/2020	7012463	Switched capacitor circuit with reduced common-mode variations
8/17/2021					
6/7/2021	Xilinx	IPR2020-01559	9/1/2020	7286075	Analog to digital converter with dither
5/25/2021	Xilinx	IPR2020-01561	9/1/2020	7719452	Pipelined converter systems with enhanced linearity
5/10/2021	Xilinx	IPR2020-01484	10/27/2020	6900750	Signal conditioning system with adjustable gain and offset mismatches
5/10/2021	Xilinx	IPR2020-01483	10/27/2020	6900750	Signal conditioning system with adjustable gain and offset mismatches
5/10/2021	Xilinx	IPR2020-01564	10/27/2020	6900750	Signal conditioning system with adjustable gain and offset mismatches

9/2021	Advanced Micro Devices	IPR	Never	Case settled before filing
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EXPERT WITNESS EXPERIENCE:

Silicon Laboratories Inc. v. Cresta Technology

Case # 3:14-cv-03227, Northern District of CA

Retained by Fulbright & Jaworski, LLP on the behalf of Silicon Laboratories, Inc.
Patent infringement

Technology: Mixed signal ICs

**Deposed: December 2015*

Lexmark v. (Confidential)

Case #: n/a

Hired directly by Lexmark in 2015

Technology: Security chip within an inkjet cartridge

Infringement analysis. Analyzed chip in the teardown of a cartridge.

Aquila Innovations v. AMD

Case #: 1:18-cv-00554-LY, Western District of TX

2018 Retained by Baker Botts, LLP on the behalf of AMD

Patent infringement

Technology: Semiconductor IC Devices – MTCMOS applied to IC

On Semiconductor v. Power Integrations

Case #: 1:17-cv-00247-LPS, District of Delaware

Retained by Baker Botts, LLP on the behalf of On Semiconductor

Patent infringement

Technology: Power conversion IC

**Deposed: July 2019*

Power Integrations v. On Semiconductor

Case #: 5:16-cv-06371-BLF, Northern District of CA

Retained by Baker Botts, LLP on the behalf of On Semiconductor

Patent infringement

Technology: Power conversion IC

**Deposed: July 2019*

On Semiconductor v. Power Integrations

Case #: 5:17-cv-03189-BLF, Northern District of CA

Retained by Baker Botts, LLP on the behalf of On Semiconductor

Patent infringement

Technology: Power conversion IC

**Deposed: July 2019*

Super Interconnect Technologies, LLC v. Huawei Device Co. et al (Google)

Case #: 2:18-cv-00462-JRG, Western District of TX

2019 Retained by O'Melveny Myers, LLP on the behalf of Super Interconnect Technologies, LLC

Patent Infringement

Technology: Combining clock and data signals

Solas OLED Ltd. v. LG Display Co. Ltd. & Sony Corporation

Case #: 6:19-cv-00236-ADA, Western District of TX

2019 Retained by Latham & Watkins on the behalf of LG Display Co. Ltd.

Patent infringement

Technology: Active matrix drive circuits for OLED TV displays

AMD Inter Partes Review for related AMD v. Aquila Innovations matter

Inter Partes Review

2019 Retained by Sterne Kessler on the behalf of AMD

Technology: Semiconductor IC devices – MTCMOS applied to gate array configurations ICs

Xilinx Inter Partes Review for related Analog Devices v. Xilinx matter

Inter Partes Review

2020 Retained by Morrison & Foerster and Slater Matsil on the behalf of Xilinx

Technology: Semiconductor IC devices

**Deposed March 2021, and April 2021*

AMD Inter Partes Review—case settled before filing

SMA SOLAR TECHNOLOGY AMERICA v. TIGO ENERGY

Oct 2022 to present

Three IPRs

CONSULTING EXPERIENCE:

STMicroelectronics (2008 – 2014)

Assisted with patent portfolio and licensing matter for mixed-signal integrated circuits

Causetag (2011 – 2012)

Owner of a retail loyalty company

Canary Medical (2014 – 2016)

Design consulting for a biometric knee implant

Chipworks (2015)

Patent portfolio analysis of mixed signal CMOS circuits

IP Value (2016)

Patent analysis of mixed signal CMOS circuits

Micromethods (2015)

Patent analysis of PLLs

SecureAccess (2014 – 2015)

Patent analysis of PLLs

(Undisclosed Party) (2018)

Hired by Howison & Arnott to provide prior art search on switch capacitors

(Confidential Party) (2018)

Hired by Norton Rose Fulbright to provide prior art search on USB circuitry

VJ Madisetti (2019)

Supported colleague with circuit analysis support. No client indicated

ZS-Systems (2019)

Circuit design support

Silicon Laboratories Technical Advisory Board (2019 to present)

Quarterly technology round table