

Muhammad Adnan

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EDUCATION **Cornell University, Ithaca, NY**
Ph.D., Electrical Engineering **08/2007-08/2013**
Area: Sub mm-wave/RF/Analog IC design *Advisor: Prof. Ehsan Afshari*
Minor: Applied Physics

National University of Sciences and Technology, Pakistan
B.Sc., Computer Engineering *GPA: 3.95/4.0* **12/2001-05/2005**

PROFESSIONAL EXPERIENCE **Mediatek Inc., San Jose, CA**
Staff Engineer **02/2015-present**

Involved in the design of RX frequency synthesizer for the next generation cellular transceivers. Specific tasks

- Studied existing oscillator topologies to obtain best FOM at the desired specs
- Designed VCOs and DCOs from 6GHz to 12 GHz to meet stringent close-in and far-out phase noise.
- Worked with layout team and verified post layout performance

Qualcomm Atheros., San Jose, CA
Senior Engineer **09/2013-02/2015**

Working on the next generation WiFi technologies. Specific tasks:

- Evaluated feasible options of TX chain design for the Atheros first WiFi in a 28nm CMOS.
- Designed Mixer and Driver Amplifier and implemented 2.4GHz TX chain with more than 20% power and more than 25% area saving.
- Met stringent requirements of EVM/ACPR linearity.
- Designed and optimized passives (inductors, baluns, transmission lines) for the TX chain.
- Worked with different teams to carry out full-chain verification from baseband filter to driver amplifier before/after layout.
- Patented idea of saving area using shared blocks between TX and synthesizer.

Qualcomm Atheros., Santa Clara, CA
Intern **05/2012-08/2012**

- Studied existing passive phase shifting techniques at 60GHz phase-array transceiver.
- Designed and implemented a process invariant, low loss passive phase shifter at 60GHz that meets the stringent group delay and loss requirements.
- Patented the idea of low loss, all-digital passive phase shifter.

Cornell University, NY
Research Assistant **07/2009-08/2013**

Focused on the design & implementation of mm-wave to THz systems in CMOS to enable affordable high-speed communication. security, detection & imaging applications.

- Completed eight chips from the conception of idea to simulation, design, layout and measurements in the lab
- Researched on various high frequency multipliers and oscillators close-to or above f_{max} (see publications).
- Reported highest power to-date 260 GHz CMOS signal source (ISSCC-2014).

Center for Adv. Research in Eng., Islamabad, Pakistan

Hardware Design Engineer

06/2005-06/2007

- Design & implemented different multiplexing/de-multiplexing algorithms of digital receivers.
- Design & implemented of Ethernet MAC core and Serial ATA UDMA programming routines.

PUBLICATIONS

- [1] **M. Adnan** and E. Afshari ,“A 247-to-263.5GHz VCO with 2.6mW peak output power and 1.14% DC-to-RF efficiency in 65nm Bulk CMOS,” *IEEE Solid-State Circuit Conference (ISSCC)* Feb 2014.
- [2] **M. Adnan**, and E. Afshari, “A 105 GHz VCO With 9.5% Tuning Range and 2.8 mW Peak Output Power in a 65nm Bulk CMOS Process,” *IEEE Transactions on Microwave Theory and Techniques (MTT)* April. 2014 (Invited).
- [3] **M. Adnan** and E. Afshari ,“A 105GHz VCO with 9.5% tuning range and 2.8mW Peak Output Power Using Coupled Colpitts Oscillators in 65nm bulk CMOS,” *IEEE Radio Frequency Integrated Circuits (RFIC)* Jun 2013.
- [4] W. Lee, **M. Adnan**, O. Momeni and E. Afshari, “A Nonlinear Lattice for High Amplitude, Picosecond Pulse Generation in CMOS,” *IEEE Transactions on Microwave Theory and Techniques (MTT)* Feb. 2012.
- [5] H. Saadat, **M. Adnan** H. Mosallaei and E. Afshari , “Composite Metamaterial and Metasurface Integrated with Non-Foster Active Circuit Elements: A Bandwidth-Enhancement Investigation,” *IEEE Transaction on Antenna and Propagation* 2012.
- [6] **M. Adnan** and E. Afshari “A Low Conversion Loss Passive Frequency Doubler,” *IEEE Custom Integrated Circuits Conf. (CICC)* Sep. 2011.
- [7] **M. Adnan** and E. Afshari “Phase Matching Using Bandgap Structures for Efficient Parametric Frequency Conversion,” *European Microwave Conference (EuMC)* Oct. 2011.
- [8] **M. Adnan**, and E. Afshari, “Efficient Microwave & Millimeter-Wave Frequency Multipliers using Nonlinear Transmission Lines in CMOS,” *IEEE Transactions on Microwave Theory and Techniques (MTT)* (Accepted).

PATENTS

- [1] D. Ehyaie, **M. Adnan**, “An all Digital Low Loss Passive Phase Shifter for mm-wave Frequencies,” US patent filed (2012).
- [2] Y. Rajavi, A. Khalili, **M. Adnan**, “Low-power RX (DTIM) synthesizer realized using existing TX hardware,” US patent filed (2015).

AWARDS AND HONORS	Sporck Analog Design Fellowship, Cornell University.	Fall-2012
	Irwin and Joan Jacobs Fellowship, Cornell University.	Spring-2012
	President Gold Medal for academic excellence.	2005
	Rector Gold Medal for best senior design project.	2005
	2nd Prize in All Pakistan Software Competition, COMPEC.	2005
	Merit Scholarship from NUST and Federal Board Pakistan.	2002-2005
	Chief of Army Staff Gold Medal for academic excellence.	2002

Paper Reviewer (official)

<i>IEEE Journal of Solid-State Circuits (JSSC)</i>	current
<i>IEEE Transactions on Microwave Theory and Techniques</i>	current
<i>IEEE International Symposium on Circuits and Systems</i>	2012
<i>IEEE International Symposium on Circuits and Systems</i>	2010

SKILLS AND TOOLS	Design: Experienced in mm-wave to THz implementation challenges, EM design and simulations in Peakview and HFSS, Cadence, Virtuoso Spectre, GoldenGate simulator, ADS, Sonnet, C/C++, Matlab and Verilog programming
	Laboratory: Network Analyzer, Spectrum Analyzer, Millimeter-wave Equipments, Harmonic Mixers, Power Meters, Wafer Probing.