

IEEE Electronics Packaging Society (EPS) - Phoenix Chapter

Formerly Known as Components, Packaging and Manufacturing Technology (CPMT) Society

Wednesday, February 28, 2018: 5:30 PM

Integrated Circuit Design for Miniature Implantable Medical Devices

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ABSTRACT

A new generation of Miniature Implantable Medical Devices (MIMDs) has arrived. Thanks to technological advances in Micro-Electro-Mechanical Systems (MEMS), electronics packaging, integrated passive devices, and solid-state batteries, many of the typical elements within Implantable Medical Devices (IMDs) can be drastically miniaturized. Custom Integrated Circuit (IC) design can then be employed to integrate these technologies – often with diverging requirements – to produce new devices that are a fraction of the size of traditional IMDs.

The new MIMDs are small enough to be implanted at the point of the sensing or therapy, thus eliminating the need for long leads, and enabling minimally invasive surgical procedures. These minimally invasive procedures reduce surgical complications, speed recovery, and drastically reduce costs.

This talk presents a comparison of MIMDs to traditional IMDs, summarizes several enabling technologies and unique design opportunities, and describes custom IC design approaches that capitalize on the available technologies and opportunities. Finally, the approaches are substantiated with a review of a recent MIMD development project that produced a complete Neuro-Stimulator device with a total device volume less than 1cc.

BIOGRAPHY

Andrew Kelly is an IC/Systems Architect at Cactus Semiconductor Inc. in Chandler, Arizona. Before joining Cactus Semiconductor, he was a Senior Principal IC Design Engineer at the Medtronic Microelectronics Center. Over the past 30 years, he has defined and designed dozens of Full Custom Mixed-Signal ICs for a wide range of Portable, Wearable, and Implantable Medical Devices such as; Glucose Meters, Hearing Aids, Neuro-Stimulators, Drug Infusion Pumps, Bio Sensors, Orthopedic Sensors, and Cardiac Pacemakers.

Date: Wednesday, February 28, 2018, 5:30 PM

Location: **Meeting Room B**
Tempe Public Library
3500 S. Rural Road, Tempe, AZ 85282
(S-W corner of Rural & Southern Ave.)
<https://www.google.com/maps/dir//tempe+library/>

Agenda: 5:30–6:00 PM: Networking & Refreshments,
6:00–7:00 PM: Presentation,
7:00 – 7:30 PM Questions & Answers
(Snacks and Soda will be provided by the IEEE Phoenix Section, CPMT Society Chapter)
IEEE members and non-members are all welcome to attend. The presentation promptly starts at 6:00 PM.

For more information, please contact any of the following CPMT officers:

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