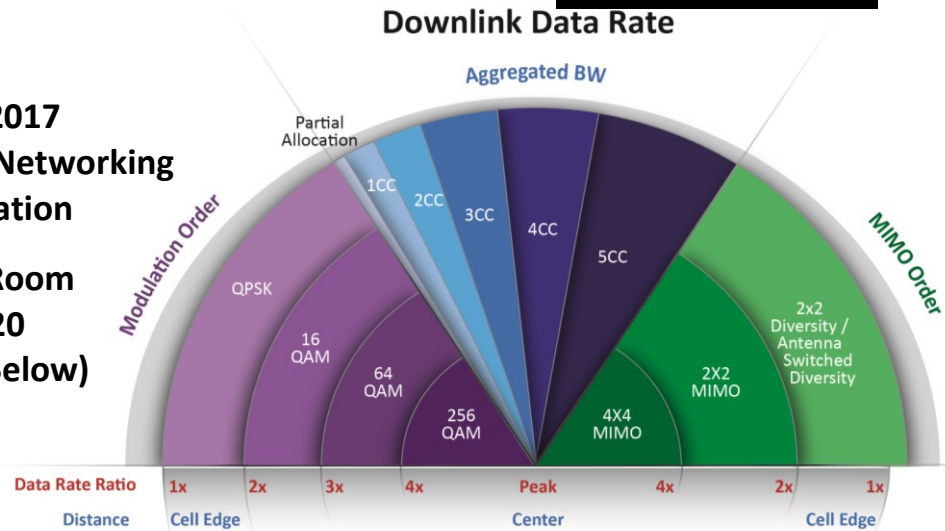


**Date/ Time: Tuesday, February 14, 2017**  
**6:30 PM Pizza & Networking**  
**7:00-8:00 PM Presentation**

**Location: Skyworks Conference Room**  
**Newbury Park, CA 91320**  
**(See RSVP/Directions Below)**



**Speaker : David Pehlke, PhD – Director Systems Engineering, Skyworks**  
**Title : The Smartphone Transition from 4G to 5G Technologies**

### Abstract:

Even as 5G technology begins to be defined in the 3GPP standards body, the significant capabilities and evolution of LTE-Advanced Pro (4G) show it to have tremendous strength in many areas that 5G is being developed to address. This presentation will try to address fundamental questions such as “What is 5G?”, “What can 5G do that 4G cannot?”, “When will 5G be available in commercial smartphones?”, and “What difference will a 5G smartphone make for me?”. As we begin this transition from 4G to 5G, the emerging requirements and challenges for the radio and RF front-end implementations are significant, as is the uncertainty of when 5G technologies will start to play a significant role. A focused discussion of the current 4G evolution will cover RF front-end (RFFE) architectures and implementations that are developing new ways to optimize LTE-Advanced PRO (Rel 13) multi-component Carrier Aggregation (CA), advanced features to increase spectral efficiency such as higher order modulation and higher order MIMO, and the concurrent operation of all of these features together. Recent trends to improve radio performance are driving specific blocks (such as the Low Noise Amplifier (LNA)) into the RF front-end, with associated architecture changes in both primary and diversity paths. CA features are supported in a number of different methods with different insertion loss, isolation, and noise figure trade-offs, and here we will examine benefits of a new category of highly integrated Diversity Receive (DRx) modules to enhance receiver sensitivity across all use cases. Movement toward higher order MIMO in the downlink (DL) is compounding additional RF Rx path support and requirements, and cost-effective solutions for optimum performance trade-offs require a holistic and complete RF system-view of both transmit (Tx) and receive (Rx) in order to address these emerging requirements. As an extension of the significant 4G developments, analysis of 5G features that support enhanced Mobile BroadBand (eMBB), Ultra Low Latency High Reliability (ULLHR), and massive Machine Type Communications (mMTC) applications, enabling technologies such as massive MIMO and beam forming, strategies for spectral and energy efficiency, radio communications at mmWave frequencies, and new flexible use of spectral resources will be summarized. The ambition of 5G is to introduce these disruptive technologies in order to meet the needs of exploding demand for mobile data and the services that support it, so-called Big Mobile Data, and to become the ubiquitous infrastructure for an extended mobile wireless future. Some concluding assessments of how and when this might happen in smartphones will be presented.

### Biography

**David R. Pehlke** is currently a senior technical director of Systems Engineering at Skyworks Solutions. He received his Ph.D. and M.S.E. in the areas of solid-state device physics and technology optimization of III-V compound semiconductors from the University of Michigan and his S.B.E.E from M.I.T. Previous experience over the last 23 years has ranged from microwave, mmWave circuit design, RF CMOS model development and cellular technology research at the Rockwell Science Center, RFIC design and service as design lead for the first polar modulator to market for EDGE applications with Ericsson Mobile Platforms, highly integrated CMOS Power Amplifier design and reference radio architecture and systems development at Silicon Laboratories and ST-Ericsson, and more recently as systems lead for the Advanced Mobile Solutions division of Skyworks. He has served as the company’s 3GPP delegate to RAN4 and RAN1, serves as the intellectual property liaison for the AMS division, and has 31 patents issued with more pending. He is an IEEE Senior member and presently chairs the IEEE Buenaventura Communications Society.

Skyworks, Intersection of West Hillcrest Drive and Lawrence Drive, Newbury Park, CA 91320  
(not the main building, please use link below to green arrow that pinpoints building)

<http://maps.google.com/maps?q=34.187542,-118.930994&num=1&t=h&vpsrc=0&ie=UTF8&z=18&iwloc=A>

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