Title: The Essential Role of Compound Semiconductors in 6G Wireless

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Abstract

The purpose of this presentation is to provide context in one of the larger industry segments making substantial use of compound semiconductors today, and which will be expanding that use in the future. Rather than a technical discussion of semiconductor design, process, or interconnect technology, this is meant to provide a business, scope and scale, and even societal perspective relating to the drivers of the necessary technologies enabled by compound semiconductors.

Since the early 1990's with the migration of GaAs MESFETs from DoD applications into 2G mobile phone power amplifiers, compound semiconductors have been essential enablers for commercial mobile communications. Today's smartphones not only continue to rely upon GaAs (and now GaN) technology for radio circuits, but also in use more compound semiconductor technologies in expanding applications in everything from efficient power-convertors for battery charging to the very bright (and now-essential) LED's on the back of all smartphones. The continuing evolution of mobile wireless is now manifest as the combination of an expanding rollout of 5G in the foreground with expanding applied research on 6G in the background. This talk will provide perspective on the business, use-case, and societal drivers of the inexorable expansion of wireless communications and how to view this in the context of the 4G to 5G to 6G evolutions. An overview of the technologies required to address the use-cases will be provided as will a perspective on the industry scale with a focus on how compound semiconductor technology must play a role with just a few technical application examples. It will conclude with a wish list from the perspective of not just how advancements will benefit the communications industry and a brief overview of some of the role Keysight is playing in this space.