

Heterogeneously Integrated Compound Semiconductors on Large-Diameter Substrates for Scaling to Consumer Market Volumes

Jonathan Klamkin, Matthew Dummer, Bei Shi, Bowen Song, Simone Suran Brunelli, Michael McGivney,
Robert Buller, Wilmer Barraza

Aeluma, Inc., Goleta, CA 93117 USA
Email: info@aeluma.com

Keywords: Compound semiconductors, heterogeneous integration, communication, sensing

Abstract

Compound semiconductors based on Gallium Arsenide (GaAs), Indium Phosphide (InP), Gallium Antimonide (GaSb), and related compounds, have been used widely in communication and sensing applications. These technologies, however, are limited in their scalability relative to Silicon (Si). Heterogeneous integration techniques enable the transfer of these materials to large-diameter substrates and the subsequent fabrication of devices with large-volume semiconductor manufacturing. Aeluma's transformative semiconductor technology combines high performance compound semiconductors with mass market microelectronics manufacturing. Aeluma deposits compound semiconductors on large-diameter substrates, including up to 12-inch Si. This technology is being applied to photodetectors and lasers for sensing and communication applications to address the needs of the automotive, mobile, defense and aerospace, communication, AR/VR, and AI markets.