

## Wide Bandgap Semiconductors: Moving from Research to Production

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Silicon carbide (SiC) and gallium nitride (GaN) are wide bandgap semiconductors (WBG) that have been the focus of research for over 30 years for applications ranging from high power electronics and high frequency amplifiers to short wavelength emitters and solid state lighting (see Fig 1.). While the inherent properties of these materials give them dramatic performance advantages over conventional semiconductors (i.e. Si and GaAs), the materials quality and application markets have not been sufficiently mature until recently to justify significant manufacturing activities. This situation appears to be changing, driven initially by technical breakthroughs and new markets for blue LEDs and solid-state lighting. More recently, WBG development has expanded into advanced electronics technologies. This talk will review the compelling material properties of SiC and GaN, discuss the expanding application areas for these materials with a focus on DoD markets, and outline the issues in manufacturing various products based on SiC or GaN.

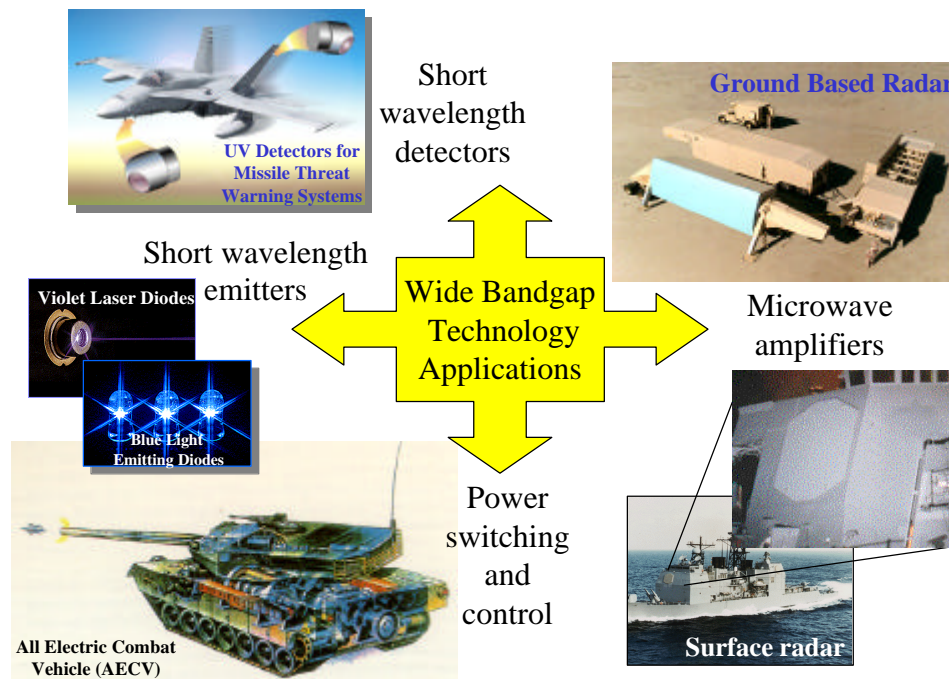


Figure 1: Potential applications for wide bandgap semiconductor technology.