EDITORIAL

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Preface to the Special Issue on Ultra-Wide Bandgap Semiconductor Gallium Oxide: from Materials to Devices

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As one of the ultra-wide bandgap (UWBG) semiconducting materials, gallium oxide has attractive properties with a wide bandgap of about 4.8 eV and a high breakdown field of about 8 MV/cm, which offers an alternative platform for various applications such as high performance power switches, RF amplifiers, solar blind photodetectors, and harsh environment signal processing. Benefited from the availability of high quality bulk Ga_2O_3 substrates, rapid advances in complex epitaxial heterostructures and high-efficient *in-situ* doping, high performance Schottky barrier diodes (SBDs), metal–oxide–semiconductor field effect transistors (MOSFETs) and solar-blind deep-ultraviolet photodetectors have been achieved. However, some obstacles in material engineering, device processing and defect engineering remain to be addressed.

In this special issue, we organized a focused discussion on the development of Ultra-Wide Bandgap Semiconductor Gallium Oxide in the aspect of material engineering and device applications. Our aim is to highlight significant contributions and broad impacts made by the leading scientists in this emerging research area, especially including the recent efforts in the relevant field made by Chinese scientists. This special issue includes 5 comprehensive review articles and 6 original research articles, which covers the recent advances in Ga_2O_3 bulk and epitaxial crystal growth, defects studying, and device design and processing.

We sincerely hope that this special issue could provide a valuable reference and perspective for the research community working in this exciting field and inspire much more researchers to enter this field. We would like to thank all the authors who have contributed high-quality peer-reviewed articles to this special issue. We are also grateful to the editorial and production staff of *Journal of Semiconductors* for their superb assistance.