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Nowadays, IT is converging with conventional technology, reinforcing industrial competitive power and opening untapped “blue ocean” market spaces that provide opportunity for growth. This convergence technology certainly is attracting a lot of attention.

In highly competitive industries producing products such as intelligent mobile multimedia terminals, sensor/MEMS-based u-healthcare systems, and energy saving high performance communication devices, the components and materials determine the properties and character of the end customer service and make or break the competitive power of those industries. Thus, the development of source technologies through interdisciplinary research in the fields of electronics, physics, material science, chemistry, and biology for convergence components and materials is the key to the creation of new industries and the establishment of future industrial infrastructures.

This special issue deals with recent advances in the studies of convergence components and materials technology, including theoretical and experimental areas. In this issue, there is a strong emphasis on topics related to next-generation thin-film oxide semiconductor technologies, IT-NT convergence components technology for sensor and MEMS systems, photonic and high frequency wireless converged technology, and energy-aware system-on-chips.

A total of 45 papers from universities, research institutes, and industries were submitted for editorial consideration, and 23 of them are published in this issue.

I would like to thank all the editors and reviewers who provided their knowledge and assistance during the review process of each paper. Particularly, I appreciate the time and effort of the Editor-in-Chief of ETRI Journal, Kyu-Seok Lee, and Editors Cheon Soo Kim, Jongdae Kim, and Sun Jin Yun, who exerted themselves to pick out the best papers among all the good candidates throughout the review process. I also warmly thank the staff members of ETRI Journal’s Editorial and Publication Office, whose generous and competent assistance has made possible the successful publication of this special issue.