

Review by Dr. Ken Gilleo

"System-On-Package (SOP)" 1st edition, by Rao Tummala and Madhavan Swaminathan, McGraw-Hill, May 2008.

This recently published book proposes that System-on-Package (SOP) will become the paradigm packaging technology of the future as we are challenged to maximize volumetric density and strive for ultra performance, but apply the synergistic design and planning to achieve the lower cost. SOP, not to be confused with other "system" packaging strategies, is carefully compared to well-known commercial technologies including System-on-Chip (SOC) and System-in-Package (SIP). This nearly 800-page book contains details of these and other packaging technologies, with valuable graphs, tables, historical background and voluminous references, making it a wide-ranging resource book for packaging in general.

SOP places an entire system on a single extreme-density chip-size package to substantially reduce the number of total components and achieve unsurpassed miniaturization. SOP addresses interconnection issues, thermal management, communications modes, and multi-function versatility. There is a balanced discussion of design, manufacturing, and infrastructure issues that arise with this radical new packaging technology. The authors argue that SOP can yield a higher return on investment (ROI) with lower risk, yet widespread adoption faces serious hurdles. While SOP may go beyond the popular System-on Chip (SOC) and System-In-Package (SIP), success requires continuing research and development for many processes and perhaps the introduction of new materials. Applications include consumer products, personal electronics, bio-medical products and electromechanical systems. Each chapter provides the background and latest status on the topic, with generous use of graphics, tables and references. This is a valuable packaging reference book that may convince you that SOP is the right path for the future.

Chapter 1. Introduction to System-on-Package (SOP) Technology

Chapter 2. Introduction to System-on-Chip (SOC)

Chapter 3. Stacked ICs and Packages (SIP)

Chapter 4. Mixed-Signal (SOP) Design

Chapter 5. Radio Frequency System-on-Package (RF SOP)

Chapter 6. Integrated Chip-to-Chip Optoelectronic SOP

Chapter 7. SOP Substrate with Multilayer Wiring and Thin-Film Embedded Components

Chapter 8. Mixed-Signal Reliability

Chapter 9. MEMS Packaging

Chapter 10. Wafer-Level SOP

Chapter 11. Thermal SOP

Chapter 12. Electrical Test of SOP Modules and Systems

Chapter 13. Biosensor SOP