System-in-Package (SiP) Die Technologies Marke y - Industrial Progress Offers Lucrative Opportunities

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System in a Package (SiP) technology created multiple enhanced packaging applications to develop solutions that are capable of being customized depending on the requirement of the user. SiP is a combination of several integrated circuits (ICs) combined in a single module or package. System in a Package gives tangible gains when space reduction is considered. Although system-on-chip (SoC) fulfills the same objective further effectively, their designs are more time consuming and complex than system in a package. SiP's simplicity has unbolted a wide collection of uses for it in not less than 10 years since its origin. ICs in System in package are interconnected to each other to form a single integrated unit. Wire bond technology and flip chip technology are the two main technologies used to interconnect the chips in system in a package.

Low cost of ownership is one of the major driving forces for the system-in-a-package market. Other factors driving the market growth include low cost required for development higher levels of integration, increased functionality with smaller size (as compared to separately packaged ICs) and better flexibility in product development. Also, rising demand for high performance and miniaturized electronic devices and high penetration in consumer electronics segment is expected to drive the systems in a package market. However, factors such as limited availability of resources and skills, re-alignment of electronic decision automation (EDA) processes and lack of known good die (KGD) are hampering the growth of the system in package market.

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The system in package market is segmented on the basis of applications into consumer electronics sector, communications sector, automotive & transportation sector, industrial sector, military, defense & aerospace (MDA) and medical sector among others. On the basis of end use, the market is segmented into RF wireless modules, high power communication devices, power amplifiers, led packages, servers, high density single module computers, portable electronics, space and military avionics and wearable computers. In addition, the systems in a package market is segmented on the basis of packaging technology into 3D IC packaging, 2.5D IC packaging and 2D IC packaging technology. The packaged chips or bare die are horizontally tiled in

2.5D or 2D technology; the only difference lies in the 2.5D IC. A silicon interposer is placed between the substrate and die in 2.5D IC while in 3D IC packaging, the packaged IC or the bare die are mounded vertically to form SiP.

Furthermore, the system in a package market is segmented on the basis of packaging type into BGA (ball grid array), pin grid array (PGA), surface mount package, small outline package (SOP) and flat package. Ball grid array is further sub-segmented into plastic ball grid array (PBGA), small ball grid array (SBGA), flip chip molded ball grid array (FCBGA) and fine ball grid array (FBGA). PGA is further sub segmented into flip chip molded pin grid array (FCPGA) and ceramic pin grid array (CPGA). Flat packages comprise of quad flat no leads (QFN) and ultra thin quad flat no leads (UTQFN) and small outline packages sub divisions are thin small outline packages (TSOP) and thin shrink small outline packages (TSSOP).

Some of the key players in the systems in a package market include Amkor Technology Inc., Chipmos Tech. Inc, ASE Inc., Chipbond Technology Corporation, GS Nanotech, Fujitsu Ltd., Insight SIP, Nanium S.A., Jiangsu Changjiang Electronics Technology Co. Ltd, Qualcomm Incorporated, Powertech Technologies Inc., Stats Chippac Ltd., Siliconware Precision Industries Co. Ltd., WI2WI Corporation and Toshiba Corporation among others.

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