

Vacuum packages for MEMS based sensors

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Vacuum continues to be an enabling environment for electronic devices into the 21st century. Here, examples include infrared IR sensing systems. Out-gassing from surfaces in these systems destroys these controlled ambient over time days to years. MEMS and MOEMS are not immune to these issues. Most of MEMS based sensors are sensitive to the operating pressure, the partial pressure of water vapor in the package, or both. For example, infrared sensors need to operate in a pressure 10-3 Torr in order to be thermally isolated from the outside world and maintain adequate sensitivity. The situation is further complicated by the need for high degrees of hermeticity leak rates on the order of 10-12 atm-cc/s and the lack of space to mount getters to control the contaminants in the package. Hermeticity is currently a significant issue in the microelectronics packaging field as a whole. Hermetically packaging MEMS devices in a reliable and economical manner is a topic of great interest to the MEMS community. The development of MEMS technology has reached a point where the packaging of the device is proving to be more difficult than the actual device development itself. Many development groups are finding their efforts stymied at this point, and interest in MEMS packaging and related topics is at a high level. In this study, among various and significant factors such as structural and geometric design of a device, considering optical design, thermal design, electrical design, mechanical design, and process design, fabrication of the device, design and fabrication of a circuit, device analysis, property measurement, design and fabrication of optical system, and design and fabrication of package module on R&D for MEMS based opto-electro-thermo-mechanical device, we will address a methodology for design, fabrication, and analysis of MEMS based infrared sensor array packaging. Also, ultimate type of wafer level packaging will be introduced in a view point of design factors and structural differences compared with on-going metal packaging

Biography

Jae Hong Park has completed his Ph.D. at the age of 33 years from Seoul National University and postdoctoral studies from Korea Institute of Science and Technology and Harvard Medical School, respectively. He is a senior researcher of National NanoFab Center in Korea. He has published more than 30 papers in reputed SCI journals and serving as an editorial board member of repute.

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