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3. Abstract Title: Reliability Assessment of COTS MEMS Components for Aerospace Environment

4. Author Listing:

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6. Abstract:

Research and development of Micro-Electro-Mechanical Systems (MEMS) in the last decade has shown a significant promise for a variety of commercial applications including automobile and medical purposes. Utilization of accelerometers for air bag and microgyros for anti-brake systems are good examples and pressure sensors are widely used for various industrial applications. Some of these components have potential to become the Commercial-off-the-shelf (COTS) components. While high reliability Applications including aerospace require much more sophisticated technology development, they would achieve significant cost savings if they could utilize COTS components in their systems.

It is more difficult to adapt MEMS component packaging for wide applications than conventional microelectronic packaging even though a lot of similar technologies are incorporated in them. Packaging of MEMS component is more complex since it needs to provide protection from the environment while allowing access to the same environment to measure or affect the desired physical or chemical parameters. The most of the silicon circuitry is sensitive to temperature, moisture, magnetic field, light, and electromagnetic interference. Therefore, testing these packages using the same methodology as standardized microelectronics packages is not possible when quality and reliability of these parts need to be assessed. This paper reviews the current status of

MEM packaging technology from COTS to specific application provides lessons learned and identifies a need for a systematic approach for this purpose.

7. Key Words: COTS, MEMS, Reliability, Aerospace Environment, and Sensors

8. Brief Biography:

Dr. R. Ramesham is working as a Senior Member of Engineering Staff at the Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA. His present research works focus on the reliability of packaging and interconnects associated with the microelectromechanical systems applications. He also works on the application of polycrystalline synthetic diamond for MEMS, electrochemical, electroanalytical, and corrosion resistant coating applications. His research work at addressed the fundamental issues involved in diamond processing techniques, heat dissipation techniques, and electrochemical applications of diamond. He has published over 92 refereed journal and proceedings articles and has made 60 national and international conference presentations. He has given invited presentations at the national and international conferences. He has offered a short course on "Fabrication of Thin Film Diamond Microstructures" at the First International Conference on the Applications of Diamond Thin Films and Related Materials, August 17-22, 1991, Auburn, AL.