NASA’S ALLIANCE WITH INDUSTRY IN DEFINING ITS ADVANCED ELECTRONIC PACKAGING AND INTERCONNECTION PROGRAM

by

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ABSTRACT

For years NASA’s use of electronic packaging and the associated manufacturing processes has been extremely conservative. This conservatism has provided spaceflight hardware designs which are proven and robust but very costly. In previous times, the system level costs (primarily mass and volume) associated with flying these robust designs was justified based on the heritage of the hardware design and manufacturing processes. With the tightening budgets across the DoD and NASA, the use of this flight proven technology is being questioned in light of the rapidly advancing areas in electronic packaging. New and emerging technologies such as microelectro mechanical systems (MEMS), photonics, integrated structural electronics, area array packaging, direct chip and chip scale packaging are now planned to fly on NASA’s near-term, flight missions.

The Jet Propulsion Laboratory is currently supporting NASA Headquarters-Code Q in defining its fiscal year 1996-98 Electronic Packaging and Advanced Interconnect research and development program. To address the issues pertaining to the unknown spaceflight quality of these new technologies, NASA is re-focusing its Advanced Packaging and interconnection Program towards cooperative teaming with industrial organizations with the primary focus of accelerating the time required to fly new electronic packaging and interconnection technologies. In addition, NASA is chartered with supporting the development and transfer of technology to non-NASA interests. These objectives are being met in two ways: 1) development of Cross Product Development Teams (CPDT) including industrial interests, academia and other government agencies; 2) by supporting industrial development of new standards and guidelines addressing new technologies. NASA has been supporting the development of some of the industrial roadmaps and uses these roadmaps to determine which areas of technology would benefit the most from NASA investment and provide NASA cost-effective access to the technology. This validation and development effort by NASA will support the maturity level and mission readiness of these technologies for applications.
outside of NASA. This effort furthers the infrastructure and confidence needed for new
technologies to gain wide market acceptance.

In FY96, NASA Code Q’s research and development activities, in the area of
electronic packaging and interconnection, will address:

- MEMS
- Chip Scale Packaging
- MMIC Packaging
- Photonics
- COB on Flex
- BGA (continued)
- 2-D & 3-D dice attachment

These activities will focus on the manufacturing processes, materials, interconnect
design and validation tools development for these technologies. These projects will also
be focused on application development and not pure research.

This technical brief will discuss the developing structure of the Cross Product
Development Teams, the primary objectives of NASA and the approach taken for each of
the FY96 technical tasks. Dissemination of the project results, technical information and
public access will also be addressed.

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