

# Considerations for 3-D Multi-Chip Modules for High Reliability Applications

Joseph Castaldo  
Data Device Corporation (DDC)  
[castaldo@ddc-web.com](mailto:castaldo@ddc-web.com)

This presentation will discuss two current standard commercial off the shelf (COTS) products the Nano Ace™ MIL-STD-1553 Remote Terminal/Monitor, BU-67743 a non-hermetic MCM and the 20 Megabit (512K x 40-Bit) EEPROM MCM, 79C2040B a dual cavity hermetic MCMs with stacked die.

There are many considerations for the users of 3-D MCMs especially for non-hermetic MCMs. Such considerations are:

- The compatibility of the different materials that comprise the MCM
- Certification to MIL-PRF-38534? If so, to what levels?
- Certification to carry out JEDEC tests?
- Certification to AS9100 standards?
- Has the design been qualified and if so, what tests were performed?
- Was a Moisture / Reflow Sensitivity Test performed and if so to what standards?
- How many temperature cycles does the manufacturer subject his parts to during the product qualification phase of the program?
- Temperature Storage Life Tests for High and Low Temperature?
- Will the supplier be able to support the customer's program over the long haul typically associated with hi-rel programs?
- Is the manufacturer under consideration able to perform flip-chip assembly?
- Experience with non-hermetic MCMs with stacked die?
- Is your program in need of a manufacturer who considered a Trusted Source by the United States Defense Microelectronics Activity (DMEA) source required?