Forty Years of Flip Chip and Solder Bumps

Paul A. Totta
IBM Fellow Emeritus
IBM East Fishkill Facility
Hopewell Junction, NY 12533

UCLA Pb-free Workshop
September 5-6, 2002
Figure 1. Power4 includes two >1-GHz superscalar cores with more than 100 GBytes/s of bandwidth to a large shared-L2 cache and more than 55 GBytes/s of bandwidth to memory and other Power4 chips.

Figure 2. Four Power4 chips will be offered in a single MCM package as an eight-processor SMP with total bandwidths of 40 GBytes/s to memory and 40 GBytes/s to other modules.
MICRO DRIVE

Product Overview
Capacity : 340MB/170MB
Form Factor : 42.8 x 36.4 x 5.0mm (CFA-Type2), 40g
Raw Card : SLC 1+1 2s2p, 0.4 mm thickness
Packaging Technology : FCA(3) & CSP(1)
Battery Powered : 3.3V
C4 Flex Assembly

- High Electrical Performance
  Close Placement of Preamp to Head
- Smaller Form Factor for Thinner HDD
- Comfortable Price Offering

Card Engineering, Circuit Packaging Operations, YASU, IBM JAPAN
OPERA G6
Managing Data Flow in a Complex World

625 Megahertz...MD-S/390 Partnership
Unparalleled Performance and Reliability

IBM
Five Steps to a Petaflop Computer
To Paul

From his 40 years of IBM colleagues and Friends - Well Done -

"I've learned a lot in sixty-three years. But, unfortunately, almost all of it is about lead"