

Low cost PCB protection is a bump away

ST. PAUL, MN—Manufacturers often use mechanical fasteners made of metal or nylon to protect PCBs and other electronic equipment from heat build-up, short circuiting, vibration, and board flexing. 3M recently adapted its existing Bumpon Protective Products—most often used as feet on table-top equipment—to offer a less expensive way to get those results while speeding up the manufacturing process.

Today's larger circuit boards—up to three-foot-square boards for telecommunications—require fasteners or spacers in more locations than the four corners, or they will flex toward the center due to the weight of the circuitry on them. If they flex too much, they can break. Rigid spacers placed on other parts of the board can prevent this.

"People are trying to get away from punching holes for fasteners in PCBs," says Ken Patterson, senior sales executive for 3M in the United Kingdom, where Bumpon products for PCBs were first introduced. "In addition, where metal spacers cost around 26 cents each and nylon spacers cost about 12 cents each, for the same applications, the Bumpon spacers cost less than half and eliminate the labor costs that go with drilling holes for mechanical spacers."

Compaq Computers (Houston, TX) uses Bumpon spacers for the table-top workstation configuration of its AlphaServer DS10 series—including the DS10L, the ultra-thin (1.75-inch) server that won *Design News's* 2001 Global Innovation Award.

"The DS10 and DS10L use the same base motherboard, but in two different enclosures," says Systems Engineer Mike Rolla, at Compaq's AlphaServer facilities in Marlborough, MA. Both configurations use four spacers on the back of the motherboard.

"The bumpers support the module, so the locations were critical," he says. "They're placed in the dual inline memory module (DIMM) connector area to mitigate the stress the module would see while installing DIMMs. We don't want to flex the board because it stresses the PCB, components, component leads, and solder joints. Because the signal routing in the memory area is extremely congested, we didn't have the option of creating holes to allow for the screw points, and the bumpers solved the problem."



The PCB inside the award-winning, 1.75-inch thick AlphaServer DS10L from Compaq Computers is extremely congested, particularly in the memory signal routing area. This leaves no room to create screw point holes for mechanical spacers to support the board and prevent flexing. Instead, the design team used 3M Bumpon spacers on the reverse side of the board to reduce stressing the board, components, leads, and solder points.

The Bumpon spacers come in both rigid and flexible types, and are made of polyurethane, which does not conduct electricity. The press-on spacers use different adhesives, depending on whether they're used for a high or low energy application. Either adhesive sets over a 24-hour period. DN

—Louise Elliott, Regional Editor
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