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Connectors Raise Density And Reduce Footprint

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A major defense contractor wanted to eliminate the use of cable assemblies for its in-the-box applications. The contractor gave W. L. Gore & Associates the challenge of developing low-profile board-to-board interconnects for its Common Radar Module (CRM) architecture. The requirements for a super-density, push-on interconnect series included the following: center-to-center spacing of 0.085 in. maximum, printed-circuit-board (PCB) -to-PCB stack height of 0.110 in. maximum, lowest possible mass, and superior phase stability. In addition, the device had to allow both radial and axial misalignment with negligible VSWR changes while meeting the environmental requirements of MIL-PRF-39012 for airborne applications.

The customer's development team and



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Gore's connector-design team worked together to define the system structure. The application called for a cost-effective and comprehensive solution requiring cradle-to-grave application and design-engineering support. This approach resulted in a coaxial push-on interconnect system, the GORE 100 Series Connector. It is

now the key interconnect in all next-generation CRM and phased-array-antenna designs.

The reduced footprint and high performance of the GORE 100 Series Connector in extreme axial and radial offsets increased board/heatsink/substructure manufacturing tolerances. The overall cost of the system was thereby reduced. The connector created a paradigm shift in the design and

application of interconnect technology across PCB, LTCC, and HTCC materials and packages. The GORE 100 Series Connector provided superior electrical performance even with axial tolerance gaps of up to .025 in. at the critical interface.

When the customer integrated the connectors on to the PCB structures and into the subsystem, it found that the challenges of phase sensitivity, VSWR performance, and repeatability of larger push-on and threaded connectors were eliminated. The integration process was simplified by custom tooling and in-the-field integration training on the connector system. The up-front engineering communication and sharing of 3D solid and electrical models gave Gore and the customer a first-generation design with fabrication and integration success as well as correlation between predicted data versus actual performance.

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