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MultiChip Products Group
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# Multi-Channel Analog-to-Digital Converter Module Integration

Analog Devices (ADI) offers a broad range of industry-leading signal processing components, products and solutions. The Multi-Chip-Module line of products combines our monolithic devices into integrated solutions.

Multi-Chip-Module PBGA products are developed at the request of commercial customers like you, who require a cost-effective solution with enabling performance and integration. ADI has a long history of providing similar highly integrated subsystems for industrial, military and aerospace applications. Often, these products are designed for extremely high performance and harsh environmental conditions. Multi-Chip-Module PBGA products are designed specifically for commercial applications where cost is a major consideration.

ADI's integrated solutions are much more than the sum of the monolithic devices. For example, the AD10226 is *more* than two monolithic analog-to-digital converters. The AD10226 is a complete IF-sampling converter module consisting of

approximately 34 optimally integrated active and passive components.
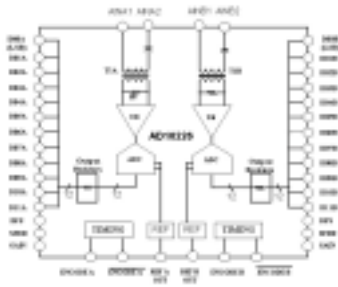
The key to the AD10226 design, and other ADI integrated module solutions is the *high-density interconnect design expertise and implementation*. In essence, ADI's interconnect technology is a "component" to be leveraged throughout the development and manu-

facturing process, which improves and optimizes system performance.
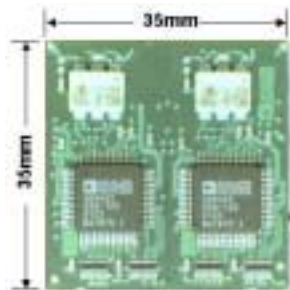
When comparing the cost of the discrete components versus the module solution, the value becomes clear, as the module provides the following:

- Multiple layers of optimized high-density interconnect and embedded power/ground planes.

- Fully-tested and guaranteed performance for the entire function.

- Improved thermal management.

- Faster time-to-market.

- Single component purchase, inventory and placement.

To obtain these same specifications/features when applying discrete components, the associated and often unanticipated additional costs include:

- Increased complexity and size of the printed circuit board.

- Test yield loss at the system integration level. By comparison, the module is a *yielded* subsystem.

- Troubleshooting and repair costs.

- More expensive thermal management hardware or printed-circuit-board design.

- Multiple component purchases, qualifications and inventory.

- Assembly yield loss at the system integration level as a result of multiple components.

Finally, the Multi-Chip Module PBGA solution offers additional benefits that are often overlooked:

- These solutions are part of a standard product family with planned year-to-year generational improvements in performance and functionality. This means that the subsystem function represented by the module will be enhanced by ADI over time, enabling system level improvements. With a discrete component approach, the customer assumes the costs associated with implementing generational improvements.

- Multiple labor-years of design/packaging/test/manufacturing expertise are represented in these Multi-Chip-Module products, and ADI has assumed the additional cost. In addition, *design-risk* and *time-to-market* implications and their associated costs should be considered in any assessment.

The MultiChip Products Group is focused on providing integrated solutions to our customers. Our 30+ years of design experience includes Linear, Digital and Mixed-Signal modules with a product portfolio that includes ADCs, DACs, signal-conditioning solutions, Multiprocessor DSPs, Synchro-to-Digital Converters, and many other signal processing subsystems. ADI's broad line of signal processing IC solutions are combined with high-performance, high-density module interconnect technologies to address complex subsystem design needs.

We hope that this overview provides a good comparison of your design choices, and a better understanding of the additional value that ADI's Multi-Chip-Modules may bring to your system. We welcome the opportunity to review your requirements.

For additional information, please contact Analog Devices' MultiChip Products Group. Telephone: (336) 668-9511, Facsimile: (336)605-4048, Internet website: http://www.analog.com.