

HCD Single-Channel RDRAM NexMod™ Speeds Time to Market for End Customers and Increases System Performance By Offering Complete Rambus Channel Onboard

SUNNYVALE, September 5, 2001 – High Connection Density today announced the availability of the first in its innovative NexMod™ product line, the RDRAM-based single channel NexMod. The basis of the NexMod concept incorporates Rambus equivalent module design rules combined with advanced package and board connect technologies to create a versatile modular subsystem. In the case of the RDRAM NexMod, this multi-tier subsystem provides virtually the complete Rambus channel design in a high density, cost effective, small footprint module. This low profile module is under 0.5 inches in height, and includes termination resistors, the Direct Rambus Clock Generator (DRCG), and Voltage Regulator Module (VRM). A system designer is relieved of the necessity of creating a unique Rambus memory channel design for each system he designs. The RDRAM NexMod solution speeds design time (time to market) for customers, while providing electrical performance advantages over current solutions and reducing board space and cost required by the memory channel. The available memory configurations range from 64MB up to 288MB utilizing 288Mb-based RDRAMs.

"HCD's RDRAM NexMod technology includes all the essential circuitry for one Rambus channel into a single module with a very small form factor," said Wade Appelman, Vice President of Advanced Networking Products at Vitesse Semiconductor Corporation. "Our customers who are currently using SO-RIMMs and RIMMs can benefit from NexMod technology since it contains virtually all the design implementation of Rambus memory for their systems and reduces board space occupied by the memory channel." The small form factor and module construction creates a situation similar to a "short channel" Rambus design allowing potentially higher clock frequency and better system electrical margin.

The RDRAM NexMod incorporates a number of features that distinguish it from traditional SO-RIMM and RIMM solutions. In addition to placing the supporting Rambus channel components on the module, the NexMod departs from traditional edge connector technologies used by RIMM and SO-RIMM, instead utilizing demountable area array connectors with lower parasitic impedances, delays, and crosstalk to achieve improved electrical performance. Now the customer can enjoy the upgrade capability and improved granularity of modules without paying a performance penalty. The NexMod provides additional flexibility by allowing attachment to the mainboard in two ways: with pin grid array (PGA) connectors or soldered directly using Ball Grid Array (BGA) technology. Both options have the same footprint, so either configuration can be used in one board design. The low profile "tiered" configuration of NexMod enables high memory capacities within a sub-1U form. The efficient configuration of the NexMod provides a complete Rambus channel in a 1.1 inch by 2.0 inch footprint, while maintaining a height of less than 0.5 inches.

"The estimated unit shipments for the networking market are projected to grow at a compound annual growth rate of 26.6% through 2005. Fundamentally, companies that supply the networking



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market will have to provide innovative higher capacity solutions under increasingly space-constrained conditions since this seems to be the direction this market segment is going. HCD's RDRAM NexMod is a key enabler for space constrained Rambus-based systems," commented Sherry Garber, analyst at market research firm Semico Research.

HCD's combined electrical, mechanical and thermal expertise has led to the development of a modular subsystem that has significantly higher electrical margins compared to RIMM and SO-RIMM solutions. Margin indicating parameters such as Tpd and delta Tpd are significantly reduced compared to those same parameters in standard RIMM and SO-RIMM modules. This is primarily due to the shortened electrical channel path facilitated by layering the printed circuit boards and placing all of the channel components onboard the module subsystem. Since the entire channel is included on the module, the HCD RDRAM solution will ease the system designer's effort to use Rambus. The electrical stability and improved margins inherent in the NexMod design means an architect can focus more time on designing in the features which will distinguish his system. "This will speed time to market for a product, while offering more reliable performance and higher manufacturing yields," commented Leo Castro, Technical Marketing Manager for HCD.

The NexMod design allows HCD's products to grow with the market's technology requirements. As end-users come to require higher frequency and increased capacity, components, or multiple channel capabilities, HCD's design is readily extendible to these configurations. Additionally, HCD's NexMod technology is the most cost effective solution for achieving high volumetric density using high frequency components like CSPs or FBGAs.

NexMod™ product solutions based on memory technologies other than Rambus will be available this year. Additionally, HCD will work with key system manufacturers to define system-level solutions integrating memory with other integrated circuits or passive components.

HCD is currently offering engineering samples of the Single-Channel RDRAM NexMod in capacities of 144MB and 288MB, with volume availability in October 2001. For product data sheets or more information on HCD's NexMod products, please contact HCD at nexmod@hcdcorp.com.

About High Connection Density Inc.:

Focusing on modular solutions that help enable the transition to next generation electronic systems, HCD's expertise in electrical, thermal, and mechanical design along with its strong manufacturing capability position HCD to be a premier source of modular subsystems and solutions for high performance electronic applications. To learn more about HCD products and services, visit the website at www.hcdcorp.com.