



## **Renesas Technology Adopts Takumi Technology's Layout Optimization Tools for Automatic Repair of Layout Hot Spots**

**Sunnyvale, California**—April 24, 2007—Takumi Technology Corp. ("Takumi"), an emerging leader in DFM software for advanced process technology, today announced the successful deployment of an automated layout optimization system for 65 nm in collaboration with Renesas Technology Corp., a leading semiconductor manufacturer and the world's number one supplier of microcontrollers.

As technology migrates from 90 nm to 65 nm to 45 nm, it is becoming far more difficult to achieve fast yield ramp due to random defects, process variations, systemic yield problems, and other limitations. An improved design methodology is needed to mitigate these problems and ensure that the appropriate attention is placed on the proper step in the chip development flow.

To avoid yield and manufacturing problems after chip design and mask data preparation, it is necessary to have cell layouts that are printable, OPC compliant, litho compliant, as insensitive as possible to process variations, and capable of achieving high yields.

Under this collaboration, Takumi and Renesas have developed a system for improving the quality of cell layouts by physical layout optimization that takes into account actual fab defect information, fab-specific litho settings, simple design rules and composite design rules. The system uses a cost-function based optimization algorithm to analyze layouts against a set of ratings, prioritizes potential failures, and performs automatic layout manipulation, resulting in yield-enhanced cell layouts that are correct by construction.

Teruaki Harada, Department Manager, DFM & EDA Technology Development Dept., LSI Product Technology Unit at Renesas Technology Corp. remarked, "When deploying a new process technology, it takes certain amount of time for the process and design rules to mature. A cell library using initial design rules is sometimes updated as the process matures through yield ramp and actual manufacturing data is gathered, however, this layout update is a very expensive and time consuming. Takumi's technology enables us to take advantage of the knowledge gained from yield ramp and apply actual fab data in a model-based approach to automate our cell library layouts enhancement efforts. We now have the ability to analyze and perform physical layout optimization on a 500-cell library to give us a better yielding library in a matter of few hours using multi-processing. This is more than 3X improvement to our development productivity."

"We have investigated various approaches to improve the quality of cell library layouts and concluded that Takumi's layout rating and cost function based layout optimization software is the most advanced off the shelf technology available today. It is a very flexible software platform that can be extended to include Renesas specific yield ratings and yield loss/improvement priorities" said Masao Nakaya, Managing Officer and Executive General Manager, LSI Product Technology Unit at Renesas Technology Corp.

"While the rest of the industry is focused on detecting layout problems, Takumi is unique in offering tools that leverage actual manufacturing data, to automatically repair layout hot spots on a GDSII layout to improve device performance and silicon yield. Our proprietary layout optimization software can perform physical layout optimization and can produce enhanced GDSII layouts that are correct by construction and have no design rule violations. We are very happy to be recognized by Renesas as a technology leader in the DFM arena and will continue to deploy

innovative products to the market place," remarked Mr. Aki Goto, CEO and President at Takumi Technology Corp.

### **About Takumi Technology Corporation**

Takumi Technology Corporation (Takumi) is the leader in providing design-for-manufacturing (DFM) system solutions for sub-wavelength process nodes. Takumi presently offers criticality-aware software solutions for backend tapeout flow, defect analysis and layout optimization. Takumi's criticality aware methodologies are completely vendor-agnostic and enable our customers to maximize their productivity and investment in their existing third-party EDA tools. Takumi's technologies have been deployed with leading IDMs in 45nm, 65nm and 90nm technology nodes. Takumi Technology B.V. (The Netherlands) and Takumi Technology KK (Japan) are wholly-owned subsidiaries of Takumi Technology Corporation.

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