MULTIBEAM DIRECT ELECTRON WRITING

**PRESS RELEASE**
March 20, 2013

**For Immediate Release**
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# Another Key Patent Issued

## E-beam Deflection with Separate Stage Tracking & Positional Error Signal

**SANTA CLARA, CA - March 20, 2013** - Multibeam Corporation announces the addition of another key patent to its IP portfolio. The U.S. Patent and Trademark Office has granted US Patent # 8,384,048 B2 to Multibeam Corporation. Multibeam specializes in electron-beam lithography, also known as e-beam direct write or EBDW, using arrays of e-beam columns designed for patterning, or writing, wafers directly without mask for semiconductor manufacturing.

This invention pertains to e-beam writing on a wafer sitting on a moving stage. While "writing on the fly" has many advantages such as higher throughput, there are positional errors in a moving stage that need to be corrected. This patent describes methods of tracking stage errors and providing corrective signals to the e-beam deflectors in the multi-column array to achieve higher accuracy in beam position placement on the wafer.

As leading logic designers have adopted gridded design rule with 1D layout style, 1D-layout devices are patterned with optical lithography today. While optical technology is excellent in printing gratings, optical cutting of the uniform lines leads to higher cost and lower yield. This is because optical patterning of the line-cut layer requires the wafer to pass through multiple cut masks, complicating the lithography process and increasing mask cost. Multibeam's lithography system is designed to pattern line-cuts in poly and metal layers, eliminating all cut masks. Our e-beam line cutting complements optical line printing. Such hybrid approach, with two lithography technologies working hand-in-hand, is called Complementary Lithography, and Multibeam's approach is known as complementary e-beam lithography, or CEBL. Multibeam's CEBL system is optimized for patterning not only line-cuts but contact and via holes as well.
Multibeam's IP portfolio, comprising 19 issued patents and a growing pipeline of pending patents, is the cornerstone for our CEBL system under development. Together with other IP, this new patent solidifies Multibeam's leadership position in multi-column CEBL lithography and multi-column e-beam inspection for small physical defect detection.

### About Multibeam Corporation

Headquartered in Santa Clara, California, Multibeam Corporation is a leading developer of multi-column e-beam technologies that add high value to semiconductor lithography by doing away with costly masks. The company's Complementary E-Beam Lithography (CEBL) system augments optical lithography at critical layers by eliminating expensive optical multiple patterning at 20nm processing nodes and beyond. Multibeam's systems can also be cost-efficiently leveraged as primary lithographic tools for low-volume production of ASICs as well as in multi-project wafer programs. Multibeam's patent-protected e-beam technologies encompass deployment of multi-column arrays to perform wafer inspection.

For more information, visit **www.multibeamcorp.com**.