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Press Release
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Mirrorcle Technologies featured in market report on MEMS displays

Mirrorcle Technologies, Inc (MTI), announces that the company is featured in a new, 37-page research report that was published on April 19, 2012 by the SEMICO Research Corporation (SEMICO). The report, dubbed "MEMS Displays: Projecting a Direct View of the Market" was authored by SEMICO's Chief of Technology Tony Massimini and covers key end-user markets for MEMS in projection and display applications. "The market for optical based MEMS is poised for exponential growth," SEMICO announced in a related press release. "In addition to MEMS devices for projection, MEMS for direct view displays have emerged. The total market was under $1 billion in 2011, but by 2016 it will reach $10.4 billion." According to SEMICO's Massimini, the Compound Annual Growth Rate (CAGR '12 to '16) for sales of optical MEMS is 62%. "We are confident that we are well situated to partake in this substantial growth," said Dr. Veljko Milanovic, Founder and CEO of Mirrorcle Technologies. "In fact, a number of major companies have already contacted us during the past year, specifically inquiring about our MEMS devices and their display capabilities."

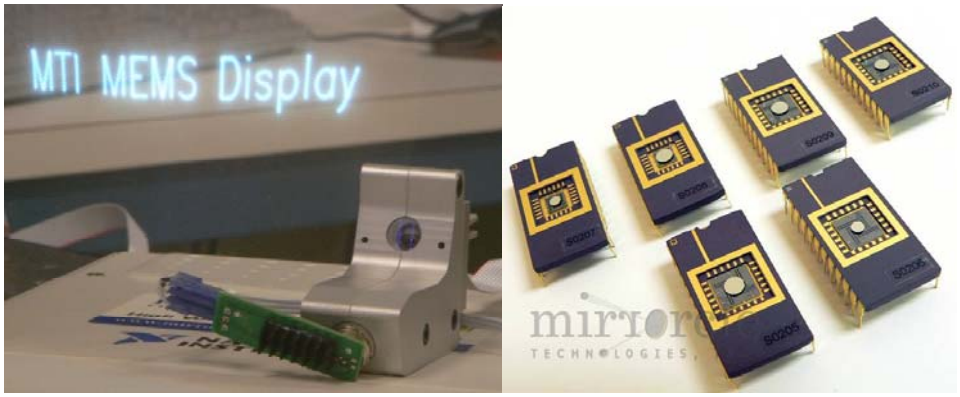

Figure 1. Mirrorcle MEMS mirror technology. On the left a laser display unit is writing text on a transparent film with special coating. On the right are MTI's various MEMS mirror designs.

Mirrorcle Technologies recognized as emerging global player

MTI has been researching and developing display solutions since 2005, when a major automotive customer first inquired about the possibility of using the company's gimbal-less MEMS mirrors for the purpose of displaying on car windshields and instrument clusters. The research has proven to be fruitful, yielding a variety of impressive device designs, demos and prototypes. In the area of displaying vector graphic content such as in the image above, where the laser beam traces out specific content as if writing with a pen, MTI has been a clear industry leader for several years, due to the high bandwidth and equally high speed

beam steering capability of its MEMS mirrors. On the other hand, in the area of displaying video-rate content, MTI competes with several other MEMS mirror companies that specialize in such technology. Dr. Milanovic commented, “MEMS mirror requirements are different for video-rate displays, and a lot of challenges must be overcome to take a laboratory demonstration of concept technology to a marketable consumer solution, especially as many other display technologies become more and more sophisticated and available.” MTI’s staff of engineers and software developers have been developing two distinct methodologies of laser-based video projection schemes: One involves one dual-axis MEMS mirror (1DA), the other two single-axis (2SA) mirrors. While the 1DA solution is potentially more compact and allows for easier and ‘cleaner’ product design, the 2SA setup has significantly better image quality, larger angle, and allows for very high refresh rates of up to 720p resolution. MTI has realized streaming video display with 1280x720 pixels with two single-axis devices that are controlled by proprietary drivers. MTI’s 1DA video display demo offers 720x480 resolution (NTSC video), and has been especially popular with visitors at the company’s Richmond, CA facility, due to its evident reliability and stability. But, while one prototype (shown below) displays vivid, rich and saturated colors possible only with laser light sources, some of MTI’s demos continue to display with only one or two lasers, blue and red. “The bottleneck for mass adoption of laser-based pico-projector devices right now is the scarce availability of highly modulatable RGB laser modules,” Dr. Milanovic commented. “Fast reacting green lasers have especially not been readily available in the market, even well after their initial announcement and sampling.”

Figure 2. Mirrorcle’s first full-color laser projection display prototype (2010).

MTI’s MEMS projection solutions for a variety of end-user markets

While some of Mirrorcle Technologies’ demos are still in the prototype phase, others have reached marketable sophistication. For the automobile industry, for instance, the company demonstrated an eye-safe, brightness-adjustable head-up display (HUD) solution at the SEMA show in Las Vegas in November 2011. Many potential clients expressed interest in the compact, low-cost and low-consumption system, which may soon be integrated in custom design vehicles and high-end consumer cars. MTI’s products are also being considered in airborne HUD solutions, both in helicopters and fighter jets. By volume, the largest anticipated market is that of mobile pico-projectors. Whether these are to be integrated in cell phones or other mobile consumer devices, MTI is looking forward to satisfying the growing

demand. “We have the capability of mass-producing our MEMS mirrors,” Dr. Milanovic explained. “Our partner, a major foundry in Asia, currently manufactures thousands of our units, but can ramp up to hundreds of thousands very quickly upon demand. We are truly ready now for our customers and welcome any inquiry about how our products can advance their display product developments.”

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About Mirrorcle Technologies, Inc.

Mirrorcle Technologies, Inc. (MTI), founded in 2005, is a California corporation that commercially provides products and services based on its proprietary optical microelectromechanical system (MEMS) technology. Since its founding, and supported by its continuous investment in R&D, MTI has offered the world's fastest point-to-point two-axis beam-steering mirrors, as well as resonating-type micromirror devices with rates up to HD video. MTI is globally the only provider of tip-tilt MEMS actuators in combination with mirrors from 0.8mm to several mm in diameter, offering customers a wide selection of specifications to optimize their paths to successful commercialization. In addition to a variety of existing designs and in-stock products, MTI also contracts to create specialty designs and fabricate custom units for its customers.

In addition to the laboratory at its headquarters, MTI has year-round, 24-7 access to wafer-based CMOS and MEMS fabrication facilities. Micromirror fabrication and wafer-level testing are performed in a clean-room environment. In 2010, MTI established a manufacturing service cooperation with a leading MEMS wafer foundry, allowing the company to ramp up volume-production while maintaining highest quality standards.

As a privately held company, MTI is able to act efficiently, offering creative and highly responsive service to its customers. The motivated staff is dedicated to provide highest-quality products and support to facilitate customers’ product development and successful commercialization. It draws on several decades of staff’s combined experience in MEMS design, fabrication, and testing.

About Semico Research Corporation

Semico Research Corp is a semiconductor marketing and consulting research company located in Phoenix, Arizona. Semico was founded in 1994 by a group of semiconductor industry experts. The company is improving the validity of semiconductor product forecasts via technology roadmaps in end-use markets. Semico offers custom consulting, portfolio packages, individual market research studies and premier industry conferences.
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