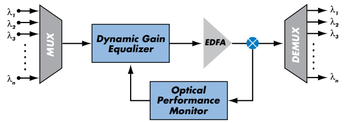
GLV Applications

High-Speed Optical Attenuation

Due to its continuously variable attenuation, high speed and accuracy, the GLV technology is particularly well suited for our next world-class optical product, a Dynamic Gain Equalizer (DGE). This technology will also be applicable for variable optical attenuators (VOA), optical performance monitors (OPM) or dynamically tunable filters.



Key areas in DWDM optical networks where GLV devices will revolutionize performance and reliability

Next-Generation Optical MEMS

In order to make the GLV technology highly reliable and cost-effective, Silicon Light Machines has amassed a substantial body of intellectual property related to underlying process technology. We are world-class experts in controlling the motion of optical surfaces to Angstrom levels of accuracy to create interference effects with light, having more than 20 issued patents in the field. We are working to extend our core technology to build other types of optical MEMS products that are responsive to the needs of customers in the optical communications field.

Non-Linear Optical Materials

Silicon Light Machines is also doing research and development in a brand new technology based on non-linear optical effects and unique materials. While products have not yet been announced, substantial resources have been committed to commercializing a technique called Quasi-Phase Matching (QPM). We will use this technology to build a variety of products that will define the next-generation of tunable optical networks.

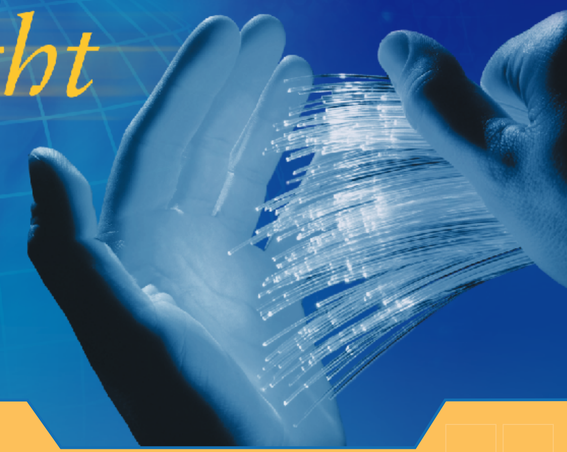
SILICON LIGHT MACHINES
A SUBSIDIARY OF CYPRESS SEMICONDUCTOR

385 Moffett Park Drive, Suite 115
Sunnyvale, CA 94089

Tel 408.541.1990
Fax 408.541.1244

www.siliconlight.com

Bringing the Power of Silicon to *Light*



SILICON LIGHT MACHINES
A SUBSIDIARY OF CYPRESS SEMICONDUCTOR

Grating Light Valve Technology

Silicon Light Machines develops and sells a range of products based on the Grating Light Valve™ (GLV™) technology. The GLV device is an example of optical micro-electro-mechanical systems, or optical MEMS; a movable, light-reflecting surface created directly on a silicon chip, utilizing standard semiconductor processes and equipment.

Silicon Light Machines' main expertise is in the areas of:

- MEMS process technology
- MEMS design and test
- Optics design
- Optical network interfaces.

The Silicon Light Machines Grating Light Valve technology is a proven means to switch, modulate and attenuate light. Its unique combination of speed, accuracy, reliability and manufacturability has been field-proven in demanding applications. Currently, Silicon Light Machines is working with its customers to apply the GLV technology for:

- Optical attenuators and switches
- Direct-to-plate printers
- HDTV monitors
- Electronic cinema projectors
- Commercial flight simulator displays.

1994

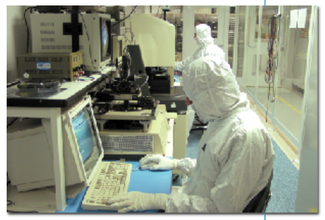
Company founded as Echelle, Inc.

Patent license from Stanford for Optical MEMS technology

1995

DARPA contract for MEMS development

1996



First development lab on line

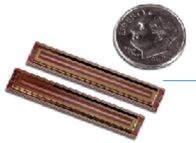
1997

First linear GLV devices

Name changed to Silicon Light Machines

SILICON LIGHT MACHINES
A SUBSIDIARY OF CYPRESS SEMICONDUCTOR

1998



Announced scanned GLV architecture (SID Best Contributed Paper Award)

1999

Production transferred to Cypress

2000

Development solely focused on optical communications

Exclusive license to Sony® for display applications

2001

Non-linear optical processing lab completed

CYPRESS

Acquired by Cypress Semiconductor

2002

First optical communication products

Backed by the manufacturing and distribution strengths of Cypress Semiconductor,

Silicon Light Machines is leveraging its unparalleled experience and expertise in optical MEMS to create optical components for large telecommunications system developers and subsystem OEMs. At the same time, Silicon Light Machines is also working on new cutting-edge technology for next-generation applications for the telecommunications market.

GLV Device Advantages

When compared with more conventional optical MEMS technologies, Silicon Light Machines' GLV technology offers the following advantages:

- *Significantly faster operating speeds – measured in nanoseconds, not milliseconds*
- *High optical efficiency – low insertion loss*
- *Continuously variable attenuation that is highly accurate and repeatable – product stability*
- *Diffraction angles are permanently set with photo lithographic precision – high performance and stability*
- *No contact surfaces – high reliability and long life*
- *Scalability to very large numbers of separately addressed channels – ultra fine resolution, low cost system*
- *Ease of manufacturing – low cost/performance ratio*
- *Ease of integration with CMOS logic – small footprint, high reliability*

Diffraction Method