

Micropatterning Director at TSMC suggests e-beam lithography may replace EUV

February 23 2012, by Bob Yirka

(PhysOrg.com) -- Most integrated circuits today are made by using extreme ultraviolet (EUV) lithography technology, but that could change, according to Burn Lin, Micropatterning Director at Taiwan Semiconductor Manufacturing Company, Ltd (TSMC) who was speaking at a SPIE Alternative Lithography Conference in San Jose last week. He says that as manufactures seek to make ever smaller and denser chips, EUV could lose its edge in allowing the industry to follow Moore's law. The answer he says, may turn out to be switching to electron beam (e-beam) lithography.

When [e-beam lithography](#) was first discovered, it was widely panned as being too slow to work in a manufacturing environment. Write times were on the order of a whole day, which was seen as more than enough time for all manner of defects to creep into the process. Thus, companies, such as TSMC have continued to use the tried and true EUV method.

Lithography is a type of printing technology. Originally it was a way to make a stamp out of a stone or metal plate without resorting to etching. Wax was applied to the plate and images were etched into it. Ink was then applied and the plate pressed against paper to produce the final product.

Modern lithography follows much the same principal to make [integrated circuits](#), except that ultraviolet light is used to chemically alter the material or film which is known in the industry as a resist. Afterwards,

those parts of the resist changed by the light can be removed, leaving behind a structure that can be used as part of a wafer. E-beam lithography tool produced by MAPPER and tested by [TSMC](#) would replace EUV with 110 electron beams focused on the resist allowing for the creation of much smaller circuits.

Lin says that advances in micromachining technology as well as those in [chip](#) performance have improved with e-beam lithography and that changing from a 300mm wafer size to 450mm could make e-beam [lithography](#) the way to go in the future. He says doing so would allow manufactures to reduce costs by fifty seven percent. He also said he believes the process would be capable of producing 150 wafers per hours, which is comparable to EUV systems.

More information: via [IEEE](#) and [Semimd](#)

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