

image to be replicated, said mask positioned over said resist such that said X-rays are incident upon said mask thereby replicating said image on said resist.

32. An X-ray lithography process comprising the steps of:

producing a laser pulse having a first pulse length; compressing the temporal width of said laser pulse to produce an energetic laser pulse having a second pulse length wherein said second pulse length is smaller than said first pulse length;

providing a target; delivering said energetic laser pulse to a location on said target thereby forming a plasma which X-rays are emitted; and

exposing a mask/X-ray resist combination to said X-rays to replicate a desired pattern on said substrate.

33. A method as defined in claim 32 wherein said compressing step further comprises the steps of:

producing a template pulse; splitting said template pulse into a plurality of secondary pulses;

delaying said plurality of secondary pulses a plurality of delay times to produce a pulse train having a pulse train period;

sequentially passing said plurality of secondary pulses through an excited laser medium having an excita-

tion period which is longer than said first pulse length thus increasing the energy of said secondary pulses; and

reassembling said plurality of increased energy secondary pulses to produce said energetic laser pulse.

34. A method as defined in claim 33 further comprising the step of repeating said step of sequentially passing said plurality of secondary pulses through said excited laser medium.

35. An x-ray lithography process compressing laser pulses comprising the steps of:

exciting a lasing medium having an energy-storage time period;

producing a train of pulses wherein each pulse in said train has a width equal to a first time period and wherein adjacent pulses are separated by a period of time equal to a second time period wherein said second time period is no greater than said energy-storage time period of said lasing medium;

transporting said train of pulses through said lasing medium; and

exposing a substrate to said X-rays, said substrate including an X-ray resist having a mask positioned thereon wherein said mask includes a pattern to be replicated, said X-rays incident upon said mask such that said pattern is replicated on said resist.

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