

Diode Pumped Solid State Laser for LPP EUV source

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Feasibility of High Power Solid State Lasers

⊕ Scalable Power

- ▶ Laser beam properties - High pulse energy (1-2J), high repetition rate, high average power (10-20kW and further)
- ▶ Simple spatial and temporal multiplexing of laser modules up to 100kHz

⊕ Technology meets litho tool specifications

- ⊕ Pulse stability, pulse control for dose control.
- ⊕ Optimum beam quality (compatibility with target, EUV collection) M^2 10-15
- ⊕ Short pulses < 10 ns for optimum CE

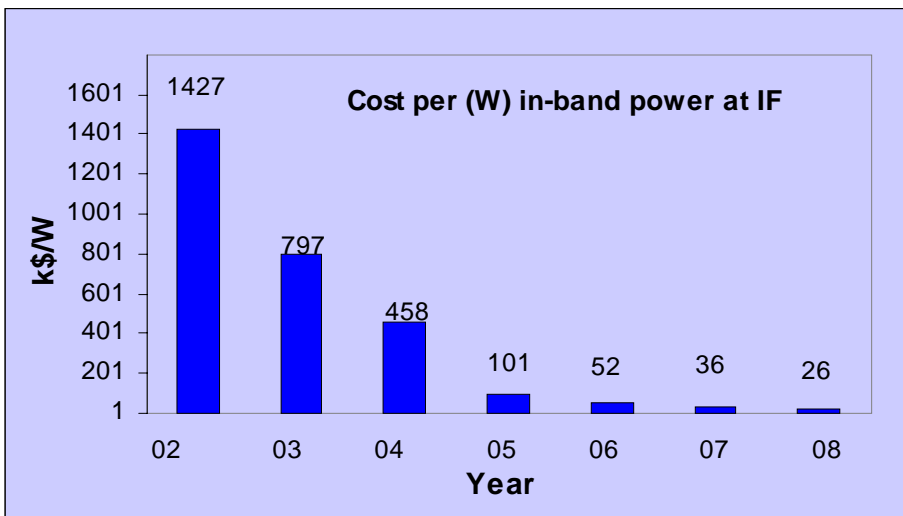
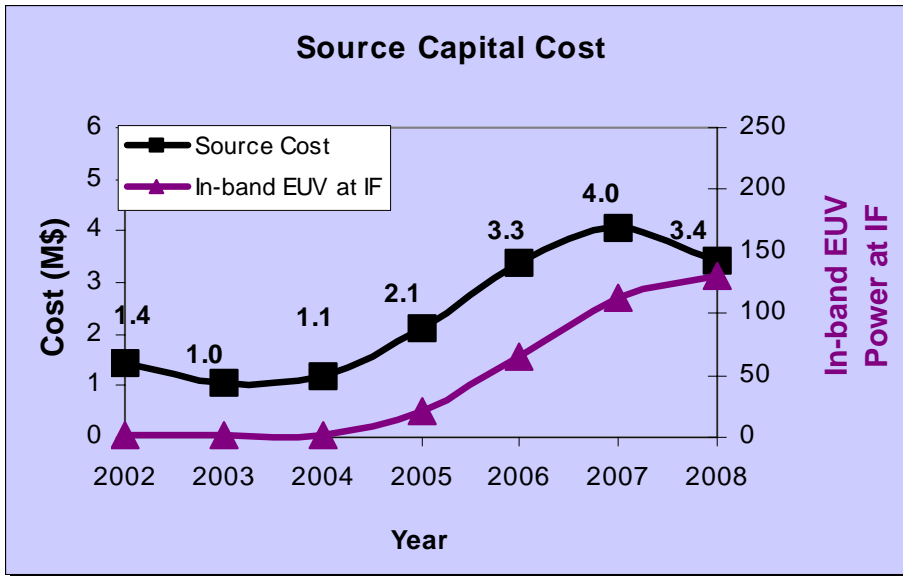
⊕ Cost of Ownership

- ⊕ Simple modular architecture, serviceable, compact small footprint
- ⊕ Diode lifetime (>10,000 continuous running – diodes are run in CW)
- ⊕ Diode cost and power improving every year (*see **Bookham press release, San Jose, CA - January 19, 2005***)
- ⊕ Energy conversion efficiency (cavity is 18%)
- ⊕ Excellent MTTR approx 2 hours

⊕ Safety

- ⊕ Ecologically friendly (no gases or chemicals)
- ⊕ Back reflection control

EUV source cost projections



Cost influences

- ⊕ Laser diode cost
- ⊕ Laser efficiency
- ⊕ Number of laser modules
- ⊕ Target technology
- ⊕ Collector efficiency