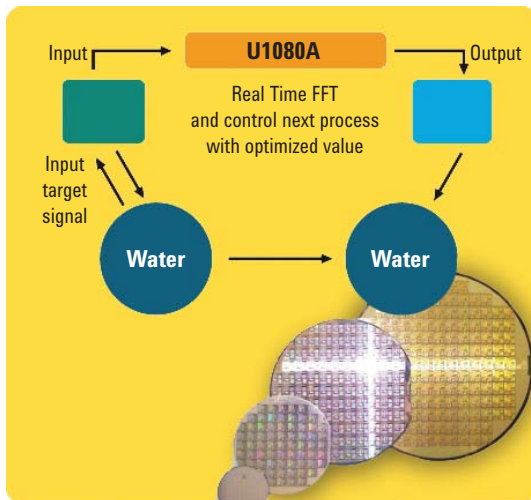




Application Overview

To meet industry demands, the next generation of photolithography wafer steppers must achieve 45-65 nm design rules. Rapid setup reconfiguration with minimum optical component realignment is required. To achieve this, OEMs need high precision metrology tools for optical lens production and a highly precise measurement & control system to stabilize interferometer fringe during the photolithography process.

Process includes: High speed and high accuracy A/D, D/A conversion and real time feedback through Fast Fourier Transfer (FFT).



High Precision Positioning Systems for Next Generation Wafer Steppers

Using a Feedback Control Signal to Stabilize Interferometer Fringe Drift

Solution Description

- U1080A, 8-bit, 2 channel, 1 GHz, 1-2 GS/s, cPCI digitizer with on-board FPGA processing.
- Real-time FFT processing firmware.
- Agilent's 2 GS/s digitizer captures and performs real time FFT processing of measurement events. The DC level derived from the U1080A's DAC output steers the stepper while minimizing interferometer fringe.
- An Agilent third party can develop FPGA firmware if the customer does not have experience in-house.



Key Features and Added Value

- Short product development time-to-market
- High speed FPGA on-board processing
- High accuracy measurements
- High transfer speed
- Product quality

Key Requirements

- A/D conversion: ≥ 1 GS/s, 1 GHz
- Real time FFT: $\leq 200 \mu\text{s}$
- D/A conversion: > 16 bits, DC output every $200 \mu\text{s}$

Resources

- U1080A digitizer with on-board FPGA processing brochure: <http://cp.literature.agilent.com/litweb/pdf/5989-7122EN.pdf>
- Data Converter product selection guide: <http://cp.literature.agilent.com/litweb/pdf/5989-8038EN.pdf>
- Digitizers website: www.agilent.com/find/embedded-digitizers

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Printed in USA, May 19, 2011
5990-4161EN



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