

## 100×100 Thermo-Piezoelectric Cantilever Array for SPM Nano-Data-Storage Application

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A PZT cantilever array with integrated heaters and piezoelectric sensors, termed a thermo piezoelectric cantilever has been fabricated and studied for application to a high-speed and low-power scanning probe microscopy (SPM)-based nano-data-storage system. In this system, the data are written using a heater and read using a piezoelectric sensor integrated with the cantilever. By the use of a piezoelectric readback method, power consumption during the read/write process can be lowered considerably. With the thermo-piezoelectric cantilever we can successfully write 40 nm data bits on the polymer media, polymethylmethacrylate (PMMA). The sensitivity of the PZT piezoelectric sensor was 0.55 fC/nm. The charge readback signal of the cantilever was obtained using a patterned SiO<sub>2</sub> sample. To improve the data rate, we developed a (100×100) 2D thermo-piezoelectric cantilever array for parallel operation.

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