

A photograph of a MEMS gyroscope, that was fabricated in an SOI wafer, is presented on the next page. The proof mass is forced to move along the x-axis and sensing is made along the y-axis. The z-axis is orthogonal to the photograph, i.e. out of the paper. Answer the following questions about it:

- 1) What is A?
- 2) What is B?
- 3) What are the holes in B for?
- 4) What is C and what is it used for?
- 5) What is D and what is it used for?
- 6) About which axis would rotational motion be sensed with this gyroscope?
- 7) Does this gyroscope sense angular position, angular rate or angular acceleration?
- 8) If the proof mass is $1 \mu\text{g}$, $Q = 100$, $f_n = 10 \text{ kHz}$, $A_x = 1 \mu\text{N}$, what is the damping coefficient, c , and the system spring constant, k , for the sensor?
- 9) For the parameters in (8), what is the amplitude of displacement along the y-axis for $\Omega = 300^\circ/\text{s}$ (hint: convert Ω to rad/s)?
- 10) For the parameters in (8), what angular rate (in $^\circ/\text{s}$) results in an amplitude of displacement along the y-axis of $1 \mu\text{m}$?

