CMOS-MEMS single-axis magnetic-field sensor for measuring geomagnetic field disturbance

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Abstract: A single-axis magnetic-field sensor is designed and implemented using TSMC 0.18μm 1P6M process for MEMS, which converts the time-varying magnetic flux into an electric signal via a capacitance-to-voltage (CV) converter. The frequency of the applied ac current is close to the resonant frequency of the MEMS structure so that efficient energy transfer from the ac current to the MEMS structure can take place. The measurable magnetic field ranges from 0.01 to 0.7 Gauss, sensitive enough to measure the geomagnetic field disturbance. The simulated sensitivity of this magnetic-field sensor is 2 mV/mGauss.

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