Advance of the micro-magnetometer MEMSMag research

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Abstract: The MEMS fluxgate magnetic sensor which is characterized by its small mass, smart volume, high sensitivity and outstanding temperature stability, is often applied on the measurements of weak magnetic fields, such as the geomagnetic field. Therefore, it is widely utilized in the field of aeronautics and aerospace field, especially in Nano-/Pico-satellites. MEMSMag, a novel type of micro fluxgate magnetic sensor (MFGM), which exploits magnetic fluxgate principle, was designed and microfabricated, Based on MEMS technology. The micro sensor probe has symmetrical geometry, and is flexible for electrical connection. MEMSMag would be easily assembled into a 3-axis subminiature magnetometer and will be applied to measure vector of the weak geomagnetic field. The microfabrication process was developed. The UV lithography technology in combination with thick negative hard-cured technology was exploited in the microfabrication. The original samples were produced with the dimension of 1 cm × 1 cm × 100um. The primary tests have been done. The integrity, conductivity and resist test, as well as transformer effect measurement were completed. The statistics, analysis and conclusion of the experimental results have been obtained.

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