

Amorphous wire & CMOS IC based sensitive micro magnetic sensors using magneto-impedance (MI) and stress-impedance (SI) effects for intelligent systems

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The MIIC (Magneto-Impedance Integrated Circuit) electronic compass in which two 1-mm long, 20- μ m diameter FeCoSiB amorphous wires are set in orthogonal combined with a CMOS IC in $3.2 \times 3.4 \times 0.8$ mm³ has been developed by Aichi Steel Co. and installed in the cellular phone as a walker's navigation [1]. The authors are further developing a frequency modulation type amorphous wire CMOS multivibrator MI sensor which can be connected with a digital signal processor (DSP) without an analog-digital (A/D) converter [2][3].

In this paper, principles of the magneto-impedance (MI) and stress-impedance effects in amorphous wires for construction of sensitive micro magnetic sensors and CMOS electronic sensor circuitry are summarized with their basic properties [4]. Typical applications of the MI and SI micro sensors for intelligent measurement and control systems such as electronic compass, torque sensor, car-passing sensor, induction motor secondary current sensor, geomagnetic sensor, inclination sensor are presented.

References

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