Amorphous wire and CMOS IC based magneto-impedance sensors - Origin, topics, and future

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Abstract: We summarize the achievement of development of the magneto-impedance sensor (MI sensor) using amorphous wires and CMOS IC since the discovery of a new principle for a sensitive micro magnetic sensor utilizing the sensitive magneto-impedance effect in a 30 μm diameter zero-magnetostrictive FeCoSiB amorphous wire on 1993, the invention of a CMOS IC inverter multivibrator type sensitive micro magnetic sensor using the pulse magneto-impedance effect in the amorphous wire on 1997, a further invention of a highly stable micro magnetic sensor for temperature variation introducing analog switches on 1999, the development of an electronic compass IC chip for mobile phones using two-axis MI geomagnetic field sensors for Telson Co., on 2003 and LG Co., on 2004, and the advanced development of a new direction and motion sensor IC chip combining a three-axis MI electronic compass with a two-axis MI inclination and acceleration sensors (5-dimensional motion sensor chip) for Vodafone Ltd., mobile phones by Aichi Steel Corporation on 2005. We also introduce a further advanced development of a 6-dimensional motion sensor chip on 2006 for mobile phones and various motion control systems.

Author Keywords: Acceleration sensor; Amorphous wire; CMOS IC; Electronic compass; Magneto-impedance; MI sensor; Mobile phone; Motion sensor

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