MASTER’S THESIS DEFENSE

ANNOUNCEMENT

THREE-DIMENSIONAL MAGNETIC FIELD SENSOR
IN IBM 0.18µm CMOS TECHNOLOGY

by
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This work presents a compact three-dimensional magnetic field sensor (MFS) designed in standard Complementary metal–oxide–semiconductor (CMOS) technology. A circular Vertical Hall Device (VHD) for horizontal magnetic field detection and a split-drain Horizontal Hall Device (HHD) for vertical magnetic field detection are combined to implement the three-dimensional MFS. This merged design has the advantage of less area and lower power consumption. The sensitivities of vertical hall device (ring-shape magneto-resistor) and horizontal hall device (split-drain magnetic field-effect transistor (SD-MAGFET)) are estimated to be 0.11V/T and 2.88V/T, respectively. Vertical direction of magnetic field detection demonstrates a higher sensitivity. A high gain cascode differential amplifier is integrated with the sensor to further amplify the magnetic signal.

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